

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
)	
Christophe Francois Guy GILBERT et al.)	Group Art Unit: To Be Assigned
)	
Application Number: To Be Assigned)	Examiner: To Be Assigned
)	
Filed: January 26, 2001)	
)	
For: STREPTOCOCCUS PNEUMONIAE PROTEINS AND NUCLEIC ACID MOLECULES)	

SUBMISSION OF SEQUENCE LISTING

Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicants submit herewith a paper copy of the Sequence Listing as filed in parent application number PCT/GB99/02451 filed July 27, 1999. The Sequence Listing in this application is identical to the Sequence Listing submitted in the parent application.

Applicants respectfully submit that it is unnecessary to file a computer readable form of the Sequence Listing, since it would be a duplicate of the computer readable form submitted in parent application number PCT/GB99/02451. Therefore, in accordance with 37 C.F.R. §1.821(e), no computer readable form is enclosed.

Applicants herewith request that the computer readable form submitted in parent application number PCT/GB99/02451 be used in this application. The undersigned certifies his belief that the computer readable form submitted in the parent application is identical in content to the paper copy of the Sequence Listing enclosed herewith.

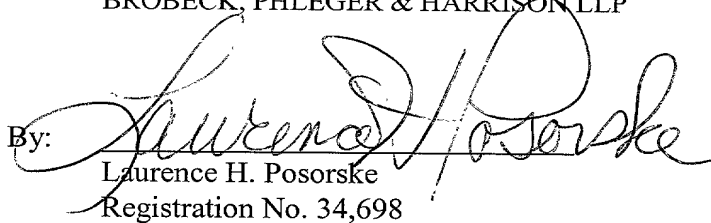
It is believed that no fees are required for this submission; however, the Commissioner is authorized to charge any fee necessary for entry of this paper to Deposit Account 50-1640.

Respectfully submitted,

BROBECK, PHLEGER & HARRISON LLP

January 26, 2001

By:



Laurence H. Posorske
Registration No. 34,698

Brobeck, Phleger & Harrison LLP
Intellectual Property Department
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Washington, D.C. 20005
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Fax: (202) 220-5200
LHP:nej

SEQUENCE LISTING

<110> Microbial Technics Limited
 Gilbert, Christophe FG
 Hansbro, Philip M

<120> Proteins

<130> PWC/P21129WO

<140> PCT/GB99/02451

<141> 1999-07-27

<150> GB 9816337.1

<151> 1998-03-27

<150> US 60/125164

<151> 1999-03-19

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00769787-012501

<213> Streptococcus pneumoniae

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Lys Asn Ser His Asp Arg Val Asp Tyr Leu Asn Asp Gly Asp His Ser
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 1905 1910 1915 1920

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 1925 1930 1935

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 1940 1945 1950

Lys Asp Ile Ala Ala Gly Asp Glu Ile Asn Val Thr Phe Lys Ala Ile
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 1985 1990 1995 2000

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 2005 2010 2015

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<213> Streptococcus pneumoniae

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Asp Glu Lys Gln Val Asp Tyr Ser Asn Lys Asn Gln Glu Glu Val Asp

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Gln Asn Lys Phe Arg Ile Gln Ile Asp Lys Thr Glu Leu Phe Val Thr

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Thr Asp Lys His Leu Glu Lys Asn Cys Cys Lys Leu Glu Leu Glu Pro

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Gln Ile Asn Asn Asp Ile Val Asn Ser Glu Ser Asn Asn Leu Leu Gly

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Glu Asp Asn Leu Asp Asn Lys Ile Lys Glu Asn Val Ser His Leu Asp

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Glu Ser Tyr Lys Leu Tyr Ser Lys Ser Asn Ser Lys Val Ser Ile Ala

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Lys Glu Glu Gly Glu Glu Gly Ile Ile Ser Asp Ile Gln Asp Arg Leu
210 215 220

Gly His Gly Thr Ala Val Val Ala Gln Ile Val Gly Asp Asp Asn Ile
225 230 235 240

Asn Gly Val Asn Pro His Val Asn Ile Asn Val Tyr Arg Ile Phe Gly
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260 265 270

Val Asp Asp Gly Asn Asp Ile Ile Asn Leu Ser Thr Gly Gln Tyr Leu
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Met Ile Asp Gly Glu Tyr Glu Asp Gly Thr Asn Asp Phe Glu Thr Phe
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Val Ala Ala Ile Val Glu His Asn Thr Ser Gly Ile Ile Ser Arg Lys
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Thr Trp Asn Asp Pro Thr Glu Leu Ala Met Leu Lys Thr Leu Val Glu
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Ser Gln Gly Gly Asp Phe Glu Lys Val Glu Lys Val Pro Asn Asn Asp
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Ala Asn Phe Met Tyr Leu Lys Asp Tyr Val Lys Glu Phe Asp Tyr Tyr
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225 230 235 240

Glu Ala Arg Lys Val Ile Gln Ala Ile Lys Lys Gly Tyr Gln Tyr Ala
245 250 255

Met Glu His Pro Glu Glu Ala Ala Asp Ile Leu Ile Lys Asn Ala Pro
260 265 270

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Arg Ala Ala Glu Phe Ile Gln Glu Asn Thr Lys Thr Asp Ile Val Asp
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Trp Ala Asp Pro Ser Leu Ala Val Glu Asn Ala Leu Ala Ala Glu Ala
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Ala Gly Val Ser Ala Leu Ala Met His Gly Arg Thr Arg Glu Gln Met
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Tyr Thr Gly His Ala Asp Leu Glu Thr Leu Tyr Lys Val Ala Gln Ala
 195 200 205

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Glu Ala Lys Gln Arg Ile Glu Glu Val Gly Ala Asp Ala Val Met Ile
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Tyr Phe Glu Thr Gly Glu Ile Leu Pro Asp Leu Thr Phe Glu Asp Lys
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Met Lys Ile Ala Tyr Glu His Leu Lys Arg Leu Ile Asn Leu Lys Gly
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Glu Asn Val Ala Val Arg Glu Phe Arg Gly Leu Ala Pro His Tyr Leu
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Ile Val Thr Asp Lys Asp Glu Ser Ser Gly Leu Gly Leu Tyr Ile Val
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Arg Lys Val Trp Ser Ser Gln Glu Trp Glu Gly His Met Gln Lys Pro
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Asn His Val Lys Ala Glu Gly Phe Leu Phe Asp Glu Ser Gly Lys Ile
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Thr Gly Val Val Ala Arg Asp Leu Leu Thr Asp Gln Val Phe Glu Ile
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Lys Ala Arg Leu Val Ile Asn Thr Thr Gly Pro Trp Ser Asp Lys Val
225 230 235 240

Arg Asn Leu Ser Asn Lys Gly Thr Gln Phe Ser Gln Met Arg Pro Thr
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Pro Val Tyr Phe Asp Thr Gly Leu Gly Asp Gly Arg Met Val Phe Val
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Leu Pro Arg Glu Asn Lys Thr Tyr Phe Gly Thr Thr Asp Thr Asp Tyr
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Thr Gly Asp Leu Glu His Pro Lys Val Thr Gln Glu Asp Val Asp Tyr
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Asp Asp Ile Glu Ser Ser Trp Ala Gly Leu Arg Pro Leu Ile Ala Gly
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Glu Ser Phe Asp Asn Leu Ile Ala Thr Val Glu Ser Tyr Leu Ser Lys
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Glu Lys Thr Arg Glu Asp Val Glu Ser Ala Val Ser Lys Leu Glu Ser
385 390 395 400

Ser Thr Ser Glu Lys His Leu Asp Pro Ser Ala Val Ser Arg Gly Ser
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Ser Leu Asp Arg Asp Asp Asn Gly Leu Leu Thr Leu Ala Gly Gly Lys
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Ile Thr Asp Tyr Arg Lys Met Ala Glu Gly Ala Met Glu Arg Val Val
435 440 445

Asp Ile Leu Lys Ala Glu Phe Asp Arg Ser Phe Lys Leu Ile Asn Ser
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Lys Thr Tyr Pro Val Ser Gly Gly Glu Leu Asn Pro Ala Asn Val Asp
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Ala Ala Gly Lys Arg Val Phe Tyr Ile Ala Pro Asn Ser Leu Ser Phe
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Glu Lys Glu Arg Ala Val Leu Glu Tyr Leu Ser Gln Gln Ala Ser Phe
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Ser Ile Thr Val Thr Arg Phe Ala Gln Met Ala Arg Tyr Leu Val Leu
 65 70 75 80

Asn Asp Leu Pro Ala Lys Thr Thr Leu Asp Asp Ile Gly Leu Gly Leu
 85 90 95

Ala Phe Tyr Lys Cys Leu Ala Glu Leu Asp Pro Lys Asp Leu Arg Val
 100 105 110

Tyr Gly Ala Ile Lys Gln Asp Pro Gln Leu Ile Gln Gln Leu Ile Glu
 115 120 125

Leu Tyr His Glu Met Thr Lys Ser Gln Met Ser Phe Leu Asp Leu Glu
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Asn Leu Thr Asp Glu Asp Lys Arg Ala Asp Leu Leu Leu Ile Phe Glu
 145 150 155 160

Lys Val Thr Ala Tyr Leu Asn Gln Gly Gln Leu Ala Gln Glu Ser Gln
 165 170 175

Leu Ser His Leu Ile Glu Ala Ile Glu Asn Asp Lys Val Ser Ser Asp
 180 185 190

Phe Asn Gln Ile Ala Leu Val Ile Asp Gly Phe Thr Arg Phe Ser Ala
 195 200 205

Glu Glu Glu Arg Val Val Asp Leu Leu His Gly Lys Gly Val Glu Ile
 210 215 220

Val Ile Gly Ala Tyr Ala Ser Lys Lys Ala Tyr Thr Ser Pro Phe Ser
 225 230 235 240

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Glu Gly Asn Leu Tyr Gln Ala Ser Val Lys Phe Leu His His Leu Ala
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Ser Lys Tyr Gln Thr Pro Ala Gln Asp Cys Ser Gln Thr His Glu Lys
260 265 270

Met Asp Ser Phe Asp Lys Ala Ser Arg Leu Leu Glu Ser Ser Tyr Asp
275 280 285

Phe Ser Glu Leu Ala Leu Asp Val Asp Glu Lys Asp Arg Glu Asn Leu
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Gln Ile Trp Ser Cys Leu Thr Gln Lys Glu Glu Leu Glu Leu Val Ala
305 310 315 320

Arg Ser Ile Arg Gln Lys Leu His Glu Asn Ser Asp Leu Ser Tyr Lys
325 330 335

His Phe Arg Ile Leu Leu Gly Asp Val Ala Ser Tyr Gln Leu Ser Leu
340 345 350

Lys Thr Ile Phe Asp Gln Tyr Gln Ile Pro Phe Tyr Leu Gly Arg Ser
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Glu Ala Met Ala His His Pro Leu Thr Gln Phe Val Glu Ser Ile Leu
370 375 380

Ala Leu Lys Arg Tyr Arg Phe Arg Gln Glu Asp Leu Ile Asn Leu Leu
385 390 395 400

Arg Thr Asp Leu Tyr Thr Asp Leu Ser Gln Ser Asp Ile Asp Ala Phe
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Glu Gln Tyr Ile Arg Tyr Leu Gly Ile Asn Gly Leu Pro Ala Phe Gln
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Gln Thr Phe Thr Lys Ser His His Gly Lys Phe Asn Leu Glu Arg Leu
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Thr Ile Lys Glu Glu Ala Asn Phe Gly Gly Lys Asp Gln Ala Phe Ile
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Gln Leu Asp Asn Gly Arg Ser Val Phe Val Arg Gly Lys Val Asp Arg
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Ile Asp Arg Leu Lys Ala Asn Gly Ala Ile Gly Val Val Asp Tyr Lys
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Ser Ser Leu Thr Gln Phe Gln Phe Pro His Phe Phe Asn Gly Leu Asn
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Ser Gln Leu Pro Thr Tyr Leu Ala Ala Leu Lys Arg Glu Gly Glu Gln
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Asn Phe Phe Gly Ala Met Tyr Leu Glu Met Ala Glu Pro Val Gln Ser
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Ser Met Lys Tyr Gln Gly Leu Phe Leu Glu Lys Glu Ser Ser Tyr Leu
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Gly Glu Phe Tyr Asn Lys Asn Lys Ala Asn Gln Leu Thr Asp Glu Glu
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Phe Gln Leu Leu Leu Asp Tyr Asn Ala Tyr Leu Tyr Lys Lys Ala Ala
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Gly Arg Ser Ile Ala Pro Tyr Val Gln Gln His Gln Ala Ile Thr Gly
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Ala Gly Ser Gly Lys Thr Phe Val Met Ala Glu Arg Ile Leu Asp Gln

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Val Lys Ala Ala Thr Glu Leu Lys Glu Arg Leu Glu Lys Lys Ile Ser

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Lys Lys Ile Gln Glu Thr Asp Asp Val Asp Leu Lys Gln His Leu Gly

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Arg Gln Leu Ala Asp Leu Pro Asn Ala Ala Ile Gly Thr Met Asp Ser

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Lys Leu Gly Gln Leu Ser Asp Gln Ile Ala Ile Leu Asp Tyr Gln Glu
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Arg Tyr His Gly Asp Thr Trp Lys Leu Ala Lys Thr Phe Gln Ser Phe
 355 360 365

Met Ser Asp Phe Val Glu Ala Tyr Arg Gln Arg Lys Arg Gln Glu Asn
 370 375 380

Ala Phe Glu Phe Ala Asp Ile Ser His Tyr Thr Ile Glu Ile Leu Glu
 385 390 395 400

Asn Phe Pro Gln Val Arg Glu Ser Tyr Gln Glu Arg Phe His Glu Val
 405 410 415

Met Val Asp Glu Tyr Gln Asp Thr Asn His Ile Gln Glu Arg Met Leu
 420 425 430

Glu Leu Leu Ser Asn Gly His Asn Arg Phe Met Val Gly Asp Ile Lys
 435 440 445

Gln Ser Ile Tyr Arg Phe Arg Gln Ala Asp Pro Gln Ile Phe Asn Glu
 450 455 460

Lys Phe Gln Arg Tyr Ala Gln Asn Pro Gln Glu Gly Arg Leu Ile Ile
 465 470 475 480

Leu Lys Glu Asn Phe Arg Ser Ser Ser Glu Val Leu Ser Ala Thr Asn
 485 490 495

Asp Val Phe Glu Arg Leu Met Asp Gln Glu Val Gly Glu Ile Asn Tyr
 500 505 510

Asp Asn Lys His Gln Leu Val Phe Ala Asn Thr Lys Leu Thr Pro Asn
 515 520 525

Pro Asp Asn Lys Ala Ala Phe Leu Leu Tyr Asp Lys Asp Asp Thr Gly
 530 535 540

Glu Glu Glu Glu Ser Gln Thr Glu Thr Lys Leu Thr Gly Glu Met Arg
545 550 555 560

Leu Val Ile Lys Glu Ile Leu Lys Leu His Gln Glu Lys Gly Val Ala
565 570 575

Phe Lys Glu Ile Ala Leu Leu Thr Ser Ser Arg Ser Arg Asn Asp Gln
580 585 590

Ile Leu Leu Ala Leu Ser Glu Tyr Gly Ile Pro Val Lys Thr Asp Gly
595 600 605

Glu Gln Asn Asn Tyr Leu Gln Ser Leu Glu Val Gln Val Met Leu Asp
610 615 620

Thr Leu Arg Val Ile His Asn Pro Leu Gln Asp Tyr Ala Leu Val Ala
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Leu Met Lys Ser Pro Met Phe Gly Phe Asp Glu Asp Glu Leu Ala Arg
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Leu Ser Leu Gln Lys Ala Glu Asp Lys Val His Glu Asn Leu Tyr Glu
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Lys Leu Val Asn Ala Gln Lys Met Ala Ser Ser Gln Lys Gly Leu Ile
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His Thr Ala Leu Ala Glu Lys Leu Lys Gln Phe Met Asp Ile Leu Ala
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Ser Trp Arg Leu Tyr Ala Lys Thr His Ser Leu Tyr Asp Leu Ile Trp
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Lys Ile Tyr Asn Asp Arg Phe Tyr Tyr Asp Tyr Val Gly Ala Leu Pro
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Asn Gly Pro Ala Arg Gln Ala Asn Leu Tyr Ala Leu Ala Leu Arg Ala
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Ala Ile Gly Glu Leu Glu Thr Lys Ser Pro Leu Gln Asp Ser Ser Gln
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Ala Asp Asn Arg Gln Ser Asp Thr Ile Lys Glu Ala Leu Glu Met Leu
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Lys Glu Val Glu Val Tyr Asn Thr Leu His Arg Ala Ala Ile Glu Leu
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Pro Ser Val Gln Thr Pro Ser Gln Ile Lys Lys Phe Tyr Glu Pro Val
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Met Asp Met Glu Gly Val Glu Ile Ala Gly Gln Gly Gln Ser Val Gly
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Lys Lys Ile Ser Phe Asp Leu Pro Asp Phe Ser Thr Lys Glu Lys Val
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Thr Gly Ala Glu Ile Gly Ser Ala Thr His Glu Leu Met Gln Arg Ile
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Gln Val Gln Thr Ser Gln Ala Val Arg Asp Lys Ile Asn Leu Asp Lys
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Ile Leu Ala Phe Phe Asp Thr Val Leu Gly Gln Glu Ile Leu Ala Asn
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Thr Asp His Leu Tyr Arg Glu Gln Pro Phe Ser Met Leu Lys Arg Asp
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Gln Lys Ser Gln Glu Asp Phe Val Val Arg Gly Ile Leu Asp Gly Tyr
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Leu Leu Tyr Glu Asn Lys Ile Val Leu Phe Asp Tyr Lys Thr Asp Arg
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10360-232600

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43

His Ile Val Phe Asn Gly Pro Asp Glu Gln Phe Leu Gly Gly Arg Leu
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Met Gly Ala Arg Ala Gly Ile Gly Gly Thr Tyr Gly Ala Met Pro Glu
115 120 125

Leu Phe Leu Lys Leu Asn Gln Leu Ile Ala Asp Lys Asp Leu Glu Thr
130 135 140

Ala Arg Glu Leu Gln Tyr Ala Ile Asn Ala Ile Ile Gly Lys Leu Thr
145 150 155 160

Ser Ala His Gly Asn Met Tyr Gly Val Ile Lys Glu Val Leu Lys Ile
165 170 175

Asn Glu Gly Leu Asn Ile Gly Ser Val Arg Ser Pro Leu Thr Pro Val
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Glu Thr Lys Glu Arg Phe Leu
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<212> PRT

<213> Streptococcus pneumoniae

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Phe Val Asp Thr Ala Met Thr Gly Gln Tyr Asn Thr Met Asp Leu Ala
35 40 45

Gly Val Ser Met Ala Thr Ser Ile Trp Asn Pro Phe Phe Thr Phe Leu
50 55 60

Thr Gly Ile Val Ser Ala Leu Val Pro Ile Ile Gly His His Leu Gly
65 70 75 80

Arg Gly Lys Lys Glu Glu Val Ala Ser Asp Phe Tyr Gln Phe Ile Tyr
85 90 95

Leu Ala Leu Gly Leu Ser Val Val Leu Leu Gly Met Val Leu Phe Leu
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Ala Pro Ile Ile Leu Asn His Ile Gly Leu Glu Ala Ala Val Ala Ala
115 120 125

Val Ala Val Arg Tyr Leu Trp Phe Leu Ser Ile Gly Ile Ile Pro Leu
130 135 140

Leu Leu Phe Ser Val Ile Arg Ser Leu Leu Asp Ser Leu Gly Leu Thr
145 150 155 160

Lys Leu Ser Met Tyr Leu Met Leu Leu Leu Leu Pro Leu Asn Ser Gly
165 170 175

Phe Asn Tyr Leu Leu Ile Tyr Gly Ala Phe Gly Val Pro Glu Leu Gly
180 185 190

Gly Ala Gly Ala Gly Leu Gly Thr Ser Leu Ala Tyr Trp Val Leu Leu
195 200 205

Gly Ile Ser Val Leu Val Leu Phe Lys Gln Glu Lys Leu Lys Ala Leu
210 215 220

His Leu Glu Lys Arg Ile Pro Leu Asn Met Asp Lys Ile Lys Glu Gly
225 230 235 240

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Val Arg Leu Gly Leu Pro Ile Gly Gly Thr Val Phe Ala Glu Val Ala
245 250 255

Ile Phe Ser Val Val Gly Leu Ile Met Ala Lys Phe Ser Pro Leu Ile
260 265 270

Ile Ala Ser His Gln Ser Ala Met Asn Phe Ser Ser Leu Met Tyr Ala
275 280 285

Phe Pro Met Ser Ile Ser Ser Ala Met Ala Ile Val Val Ser Tyr Glu
290 295 300

Val Gly Ala Lys Arg Phe Asp Asp Ala Lys Thr Tyr Ile Gly Leu Gly
305 310 315 320

Arg Trp Thr Ala Leu Ile Phe Ala Ala Phe Thr Leu Thr Phe Leu Tyr
325 330 335

Ile Phe Arg Gly Asn Val Ala Ser Leu Tyr Gly Asn Asp Pro Lys Phe
340 345 350

Ile Asp Leu Thr Val Arg Phe Leu Thr Tyr Ser Leu Phe Phe Gln Leu
355 360 365

Ala Asp Thr Phe Ala Ala Pro Leu Gln Gly Ile Leu Arg Gly Tyr Lys
370 375 380

Asp Thr Val Ile Pro Phe Tyr Leu Gly Leu Leu Gly Tyr Trp Gly Val
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Ala Ile Pro Val Tyr Ala Ile
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109210-1663260

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<211> 189

<212> PRT

<213> Streptococcus pneumoniae

<400> 15

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Asp Gly Ile Arg Val Arg Gln Leu Ala Glu Leu Leu Ser Leu Pro Pro

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25

30

Thr Gly Ile Gln Gln Ser Leu Gly Lys Leu Ala Gln Lys Tyr Glu Lys

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Asp Pro Asp Ser Ser Leu Ala Leu Ile Glu Thr Ser Gly Ala Tyr Arg

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Leu Val Thr Lys Pro Gln Phe Ala Glu Ile Leu Lys Glu Tyr Ser Lys

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Ala Pro Ile Asn Gln Ser Leu Ser Arg Ala Ala Leu Glu Thr Leu Ser

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Ile Ile Ala Tyr Lys Gln Pro Ile Thr Arg Ile Glu Ile Asp Ala Ile

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Arg Gly Val Asn Ser Ser Gly Ala Leu Ala Lys Leu Gln Ala Phe Asp

115

120

125

Leu Ile Lys Glu Asp Gly Lys Lys Glu Val Leu Gly Arg Pro Asn Leu

130

135

140

Tyr Val Thr Thr Asp Tyr Phe Leu Asp Tyr Met Gly Ile Asn His Leu

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Glu Glu Leu Pro Val Ile Asp Glu Leu Glu Ile Gln Ala Gln Glu Ser

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170

175

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<211> 311
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<213> Streptococcus pneumoniae
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Phe Glu Gly Asp Ala Asn Pro Leu Tyr Asp Ala Tyr Ile Val Glu Ala
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Asn Thr Pro Asn Asp Val Lys Thr Ile Ala Glu Asp Ala Lys Lys Ile
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Glu Gly Val Ser Glu Val Gln Asp Gly Gly Ala Asn Thr Glu Arg Leu
                      165                      170                      175

Phe Lys Leu Ala Ser Phe Ile Arg Val Trp Gly Leu Gly Ile Ala Ala
                      180                      185                      190

Leu Leu Ile Phe Ile Ala Val Phe Leu Ile Ser Asn Thr Ile Arg Ile
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Thr Ile Ile Ser Arg Ser Arg Glu Ile Gln Ile Met Arg Leu Val Gly
                      210                      215                      220

Ala Lys Asn Ser Tyr Ile Arg Gly Pro Phe Leu Leu Glu Gly Ala Phe
225                      230                      235                      240

Ile Gly Leu Leu Gly Ala Ile Ala Pro Ser Val Leu Val Phe Ile Val
                      245                      250                      255

Tyr Gln Ile Val Tyr Gln Ser Val Asn Lys Ser Leu Val Gly Gln Asn
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Leu Ser Met Ile Ser Pro Asp Leu Phe Ser Pro Leu Met Ile Ala Leu
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Met Arg Arg Phe Leu Lys Ile
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Ser Pro Glu Gly Ala Met Ala Ser Asp Gly Thr Trp Gln Gly Lys Gln

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25

30

Tyr Leu Lys Glu Asp Gly Ser Gln Ala Ala Asn Glu Trp Val Phe Asp

35

40

45

Thr His Tyr Gln Ser Trp Phe Tyr Ile Lys Ala Asp Ala Asn Tyr Ala

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55

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Glu Asn Glu Trp Leu Lys Gln Gly Asp Asp Tyr Phe Tyr Leu Lys Ser

65

70

75

80

Gly Gly Tyr Met Ala Lys Ser Glu Trp Val Glu Asp Lys Gly Ala Phe

85

90

95

Tyr Tyr Leu Asp Gln Asp Gly Lys Met Lys Arg Asn Ala Trp Val Gly

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110

Thr Ser Tyr Val Gly Ala Thr Gly Ala Lys Val Ile Glu Asp Trp Val

115

120

125

Tyr Asp Ser Gln Tyr Asp Ala Trp Phe Tyr Ile Lys Ala Asp Gly Gln

130

135

140

His Ala Glu Lys Glu Trp Leu Gln Ile Lys Gly Lys Asp Tyr Tyr Phe

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Lys Ser Gly Gly Tyr Leu Leu Thr Ser Gln Trp Ile Asn Gln Ala Tyr

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170

175

F03670-286960

Val Asn Ala Ser Gly Ala Lys Val Gln Gln Gly Trp Leu Phe Asp Lys
180 185 190

Gln Tyr Gln Ser Trp Phe Tyr Ile Lys Glu Asn Gly Asn Tyr Ala Asp
195 200 205

Lys Glu Trp Ile Phe Glu Asn Gly His Tyr Tyr Tyr Leu Lys Ser Gly
210 215 220

Gly Tyr Met Ala Ala Asn Glu Trp Ile Trp Asp Lys Glu Ser Trp Phe
225 230 235 240

Tyr Leu Lys Phe Asp Gly Lys Met Ala Glu Lys Glu Trp Val Tyr Asp
245 250 255

Ser His Ser Gln Ala Trp Tyr Tyr Phe Lys Ser Gly Gly Tyr Met Thr
260 265 270

Ala Asn Glu Trp Ile Trp Asp Lys Glu Ser Trp Phe Tyr Leu Lys Ser
275 280 285

Asp Gly Lys Ile Ala Glu Lys Glu Trp Val Tyr Asp Ser His Ser Gln
290 295 300

Ala Trp Tyr Tyr Phe Lys Ser Gly Gly Tyr Met Thr Ala Asn Glu Trp
305 310 315 320

Ile Trp Asp Lys Glu Ser Trp Phe Tyr Leu Lys Ser Asp Gly Lys Ile
325 330 335

Ala Glu Lys Glu Trp Val Tyr Asp Ser His Ser Gln Ala Trp Tyr Tyr
340 345 350

Phe Lys Ser Gly Gly Tyr Met Ala Lys Asn Glu Thr Val Asp Gly Tyr
355 360 365

Gln Leu Gly Ser Asp Gly Lys Trp Leu Gly Gly Lys Thr Thr Asn Glu
370 375 380

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Asn Ala Ala Tyr Tyr Gln Val Val Pro Val Thr Ala Asn Val Tyr Asp
385 390 395 400

Ser Asp Gly Glu Lys Leu Ser Tyr Ile Ser Gln Gly Ser Val Val Trp
405 410 415

Leu Asp Lys Asp Arg Lys Ser Asp Asp Lys Arg Leu Ala Ile Thr Ile
420 425 430

Ser Gly Leu Ser Gly Tyr Met Lys Thr Glu Asp Leu Gln Ala Leu Asp
435 440 445

Ala Ser Lys Asp Phe Ile Pro Tyr Tyr Glu Ser Asp Gly His Arg Phe
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Tyr His Tyr Val Ala Gln Asn Ala Ser Ile Pro Val Ala Ser His Leu
465 470 475 480

Ser Asp Met Glu Val Gly Lys Lys Tyr Tyr Ser Ala Asp Gly Leu His
485 490 495

Phe Asp Gly Phe Lys Leu Glu Asn Pro Phe Leu Phe Lys Asp Leu Thr
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Glu Ala Thr Asn Tyr Ser Ala Glu Glu Leu Asp Lys Val Phe Ser Leu
515 520 525

Leu Asn Ile Asn Asn Ser Leu Leu Glu Asn Lys Gly Ala Thr Phe Lys
530 535 540

Glu Ala Glu Glu His Tyr His Ile Asn Ala Leu Tyr Leu Leu Ala His
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Ser Ala Leu Glu Ser Asn Trp Gly Arg Ser Lys Ile Ala Lys Asp Lys
565 570 575

Asn Asn Phe Phe Gly Ile Thr Ala Tyr Asp Thr Thr Pro Tyr Leu Ser
580 585 590

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Ala Lys Thr Phe Asp Asp Val Asp Lys Gly Ile Leu Gly Ala Thr Lys
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Trp Ile Lys Glu Asn Tyr Ile Asp Arg Gly Arg Thr Phe Leu Gly Asn
610 615 620

Lys Ala Ser Gly Met Asn Val Glu Tyr Ala Ser Asp Pro Tyr Trp Gly
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Glu Lys Ile Ala Ser Val Met Met Lys Ile Asn Glu Lys Leu Gly Gly
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Lys Asp

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<212> PRT

<213> Streptococcus pneumoniae

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Ala Phe Tyr Ser Phe Thr Asn Trp Thr Gly Leu Thr Tyr Asn Tyr Lys
35 40 45

Phe Val Gly Leu Asn Asn Phe Lys Leu Leu Phe Met Asp Pro Lys Phe
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Met Asn Ala Ile Gly Phe Thr Ala Ile Ile Ala Ile Ala Met Val Val
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Gly Glu Ile Ala Leu Gly Ile Phe Ile Ala Arg Val Leu Asn Ser Lys
85 90 95

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Ile Lys Gly Gln Thr Phe Phe Arg Ala Trp Phe Phe Phe Pro Ala Val
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Leu Ser Gly Leu Thr Val Ala Leu Ile Phe Lys Gln Val Phe Asn Tyr
 115 120 125

Gly Leu Pro Ala Ile Gly Asn Ala Leu His Ile Glu Phe Phe Gln Thr
 130 135 140

Ser Leu Leu Gly Thr Lys Trp Gly Ala Ile Phe Ala Ala Val Phe Val
 145 150 155 160

Leu Leu Trp Gln Gly Val Ala Met Pro Ile Ile Ile Phe Leu Ala Gly
 165 170 175

Leu Gln Ser Ile Pro Thr Glu Ile Thr Glu Ala Ala Arg Ile Asp Gly
 180 185 190

Ala Thr Ser Lys Gln Val Phe Trp Asn Ile Glu Leu Pro Tyr Leu Leu
 195 200 205

Pro Ser Val Ser Met Val Phe Ile Leu Ala Leu Lys Gly Gly Leu Thr
 210 215 220

Ala Phe Asp Gln Val Phe Ala Met Thr Gly Gly Gly Pro Asn Asn Ala
 225 230 235 240

Thr Thr Ser Leu Gly Leu Leu Val Tyr Asn Tyr Ala Phe Lys Asn Asn
 245 250 255

Gln Phe Gly Tyr Ala Asn Ala Ile Ala Val Ile Leu Phe Phe Leu Ile
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Val Val Ile Ser Ile Ile Gln Leu Arg Val Ser Lys Lys Phe Glu Ile
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Phe Ser Ser Phe Lys Pro Thr Lys Asp Ile Val Asp Asn Phe Phe Gly
 35 40 45

Phe Pro Thr Asn Phe Thr Trp Asp Asn Phe Ser Arg Leu Leu Ala Asp
 50 55 60

Gly Ile Gly Gly Tyr Tyr Trp Asn Ser Val Val Ile Thr Val Leu Ser
 65 70 75 80

Leu Leu Ala Val Met Ile Phe Ile Pro Met Ala Ala Tyr Ser Ile Ala
 85 90 95

Arg Asn Met Ser Lys Arg Lys Ala Phe Thr Ile Met Tyr Thr Leu Leu
 100 105 110

Ile Leu Gly Ile Phe Val Pro Phe Gln Val Ile Met Ile Pro Ile Thr
 115 120 125

Val Met Met Ser Lys Leu Gly Leu Ala Asn Thr Phe Gly Leu Ile Leu
 130 135 140

Leu Tyr Leu Thr Tyr Ala Ile Pro Gln Thr Leu Phe Leu Tyr Val Gly
 145 150 155 160

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55

Tyr Ile Lys Ile Ser Ile Pro Glu Ser Leu Asp Glu Ala Ala Glu Ile
165 170 175

Asp Gly Ala Asn Gln Phe Thr Thr Tyr Phe Arg Ile Ile Phe Pro Met
180 185 190

Met Lys Pro Met His Ala Thr Thr Met Ile Ile Asn Ala Leu Trp Phe
195 200 205

Trp Asn Asp Phe Met Leu Pro Leu Leu Val Leu Asn Arg Asp Ser Lys
210 215 220

Met Trp Thr Leu Pro Leu Phe Gln Tyr Asn Tyr Ala Gly Gln Tyr Phe
225 230 235 240

Asn Asp Tyr Gly Pro Ser Phe Ala Ser Tyr Val Val Gly Ile Ile Ser
245 250 255

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260 265 270

Ser Asn Gly Ala Val Lys
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<212> PRT

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Gly Leu Val Ala Ser Val Gly Met Phe Leu Phe Thr Ile Phe Phe Leu
 35 40 45

His Tyr Gln Ser Ile Leu Ser His Lys Phe Phe Arg Leu Ile Leu Gln
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Phe Val Leu Phe Gly Ser Val Leu Ser Ala Ala Phe Ala Ser Leu Glu
 65 70 75 80

His Phe Gln Ile Val Lys Lys Phe Asn Tyr Ala Phe Leu Ser Pro Asn
 85 90 95

Met Gln Val Trp His Gln Asn Arg Ala Glu Val Thr Phe Phe Asn Pro
 100 105 110

Asn Tyr Tyr Gly Ile Ile Cys Cys Phe Cys Ile Met Ile Ala Phe Tyr
 115 120 125

Leu Phe Thr Thr Thr Lys Leu Asn Trp Leu Lys Val Phe Cys Val Ile
 130 135 140

Ala Gly Phe Val Asn Leu Phe Gly Leu Asn Phe Thr Gln Asn Arg Thr
 145 150 155 160

Ala Phe Pro Ala Ile Ile Ala Gly Ala Ile Ile Tyr Leu Phe Thr Thr
 165 170 175

Ile Lys Asn Trp Lys Ala Phe Trp Leu Ser Ile Gly Val Phe Ala Ile
 180 185 190

Gly Leu Ser Phe Leu Phe Ser Ser Asp Leu Gly Val Arg Met Gly Thr
 195 200 205

Leu Asp Ser Ser Met Glu Glu Arg Ile Ser Ile Trp Asp Ala Gly Met
 210 215 220

Ala Leu Phe Lys Gln Asn Pro Phe Trp Gly Glu Gly Pro Leu Thr Tyr
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<212> PRT

<213> Streptococcus pneumoniae

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35 40 45

58

Pro Phe Glu Gly Leu Asn Lys Ser Ile Ala Ser Val Phe Gly Ala Asn
50 55 60

Trp Thr Glu Pro Phe Met Gln Val Tyr Ser Gly Thr Phe Ala Ile Met
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Gly Leu Ile Ser Cys Phe Ser Ile Ala Tyr Ser Tyr Ala Lys Asn Ser
85 90 95

Gly Val Glu Ala Leu Pro Ala Gly Val Leu Ser Val Ser Ala Phe Phe
100 105 110

Ile Leu Leu Arg Ser Ser Tyr Ile Pro Lys Gln Gly Glu Ala Ile Gly
115 120 125

Asp Ala Ile Ser Lys Val Trp Phe Gly Gly Gln Gly Ile Ile Gly Ala
130 135 140

Ile Ile Ile Gly Leu Val Val Gly Ser Ile Tyr Thr Phe Phe Ile Lys
145 150 155 160

Arg Lys Ile Val Ile Lys Met Pro Glu Gln Val Pro Gln Ala Ile Ala
165 170 175

Lys Gln Phe Glu Ala Met Ile Pro Ala Phe Val Ile Phe Leu Ser Ser
180 185 190

Met Ile Val Tyr Ile Leu Ala Lys Ser Leu Thr Asn Gly Gly Thr Phe
195 200 205

Ile Glu Met Ile Tyr Ser Ala Ile Gln Val Pro Leu Gln Gly Leu Thr
210 215 220

Gly Ser Leu Tyr Gly Ala Ile Gly Ile Ala Phe Phe Ile Ser Phe Leu
225 230 235 240

Trp Trp Phe Gly Val His Gly Gln Ser Val Val Asn Gly Val Val Thr
245 250 255

09769797 042504

Ala Leu Leu Leu Ser Asn Leu Asp Ala Asn Lys Ala Met Leu Ala Ser
 260 265 270

Ala Asn Leu Ser Leu Glu Asn Gly Ala His Ile Val Thr Gln Gln Phe
 275 280 285

Leu Asp Ser Phe Leu Ile Leu Ser Gly Ser Gly Ile Thr Phe Gly Leu
 290 295 300

Val Val Ala Met Leu Phe Ala Ala Lys Ser Lys Gln Tyr Gln Ala Leu
 305 310 315 320

Gly Lys Val Ala Ala Phe Pro Ala Ile Phe Asn Val Asn Glu Pro Val
 325 330 335

Val Phe Gly Phe Pro Ile Val Met Asn Pro Val Met Phe Val Pro Phe
 340 345 350

Ile Leu Val Pro Val Leu Ala Ala Val Ile Val Tyr Gly Ala Ile Ala
 355 360 365

Thr Gly Phe Met Gln Pro Phe Ser Gly Val Thr Leu Pro Trp Ser Thr
 370 375 380

Pro Ala Ile Leu Ser Gly Phe Leu Val Gly Gly Trp Gln Gly Val Ile
 385 390 395 400

Thr Gln Leu Val Ile Leu Ala Met Ser Thr Leu Val Tyr Phe Pro Phe
 405 410 415

Phe Lys Val Gln Asp Arg Leu Ala Tyr Gln Asn Glu Ile Lys Gln Ser
 420 425 430

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60

<210> 22

<211> 100

<212> PRT

<213> Streptococcus pneumoniae

<400> 22

Met Lys Lys Lys Asp Leu Val Asp Gln Leu Val Ser Glu Ile Glu Thr

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10

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Gly Lys Val Arg Thr Leu Gly Ile Tyr Gly His Gly Ala Ser Gly Lys

20

25

30

Ser Thr Phe Ala Gln Glu Leu Tyr Gln Ala Leu Asp Ser Thr Thr Val

35

40

45

Asn Leu Leu Glu Thr Asp Pro Tyr Ile Thr Ser Gly Arg His Leu Val

50

55

60

Val Pro Lys Asp Ala Pro Asn Gln Lys Val Thr Ala Ser Leu Pro Val

65

70

75

80

Ala His Glu Leu Glu Ser Leu Gln Arg Asp Ile Leu Ala Cys Arg Arg

85

90

95

Val Trp Met Ser

100

<210> 23

<211> 238

<212> PRT

<213> Streptococcus pneumoniae

<400> 23

Met Lys Lys Arg Tyr Leu Val Leu Thr Ala Leu Leu Ala Leu Ser Leu

1

5

10

15

61

Ala Ala Cys Ser Gln Glu Lys Thr Lys Asn Glu Asp Gly Glu Thr Lys
20 25 30

Thr Glu Gln Thr Ala Lys Ala Asp Gly Thr Val Gly Ser Lys Ser Gln
35 40 45

Gly Ala Ala Gln Lys Lys Ala Glu Val Val Asn Lys Gly Asp Tyr Tyr
50 55 60

Ser Ile Gln Gly Lys Tyr Asp Glu Ile Ile Val Ala Asn Lys His Tyr
65 70 75 80

Pro Leu Ser Lys Asp Tyr Asn Pro Gly Glu Asn Pro Thr Ala Lys Ala
85 90 95

Glu Leu Val Lys Leu Ile Lys Ala Met Gln Glu Ala Gly Phe Pro Ile
100 105 110

Ser Asp His Tyr Ser Gly Phe Arg Ser Tyr Glu Thr Gln Thr Lys Leu
115 120 125

Tyr Gln Asp Tyr Val Asn Gln Asp Gly Lys Ala Ala Ala Asp Arg Tyr
130 135 140

Ser Ala Arg Pro Gly Tyr Ser Glu His Gln Thr Gly Leu Ala Phe Asp
145 150 155 160

Val Ile Gly Thr Asp Gly Asp Leu Val Thr Glu Glu Lys Ala Ala Gln
165 170 175

Trp Leu Leu Asp His Ala Ala Asp Tyr Gly Phe Val Val Arg Tyr Leu
180 185 190

Lys Gly Lys Glu Lys Glu Thr Gly Tyr Met Ala Glu Glu Trp His Leu
195 200 205

Arg Tyr Val Gly Lys Glu Ala Lys Glu Ile Ala Ala Ser Gly Leu Ser
210 215 220

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Leu Glu Glu Tyr Tyr Gly Phe Glu Gly Gly Asp Tyr Val Asp
 225 230 235

<210> 24

<211> 425

<212> PRT

<213> Streptococcus pneumoniae

<400> 24

Met Arg Glu Pro Asp Phe Leu Asn His Phe Leu Lys Lys Gly Tyr Phe
 1 5 10 15

Lys Lys His Ala Lys Ala Val Leu Ala Leu Ser Gly Gly Leu Asp Ser
 20 25 30

Met Phe Leu Phe Lys Val Leu Ser Thr Tyr Gln Lys Glu Leu Glu Ile
 35 40 45

Glu Leu Ile Leu Ala His Val Asn His Lys Gln Arg Ile Glu Ser Asp
 50 55 60

Trp Glu Glu Lys Glu Leu Arg Lys Leu Ala Ala Glu Ala Glu Leu Pro
 65 70 75 80

Ile Tyr Ile Ser Asn Phe Ser Gly Glu Phe Ser Glu Ala Arg Ala Arg
 85 90 95

Asn Phe Arg Tyr Asp Phe Phe Gln Glu Val Met Lys Lys Thr Gly Ala
 100 105 110

Thr Ala Leu Val Thr Ala His His Ala Asp Asp Gln Val Glu Thr Ile
 115 120 125

Phe Met Arg Leu Ile Arg Gly Thr Arg Leu Arg Tyr Leu Ser Gly Ile
 130 135 140

09769797 043604

Lys Glu Lys Gln Val Val Gly Glu Ile Glu Ile Ile Arg Pro Phe Leu
 145 150 155 160

His Phe Gln Lys Lys Asp Phe Pro Ser Ile Phe His Phe Glu Asp Thr
 165 170 175

Ser Asn Gln Glu Asn His Tyr Phe Arg Asn Arg Ile Arg Asn Ser Tyr
 180 185 190

Leu Pro Glu Leu Glu Lys Glu Asn Pro Arg Phe Arg Asp Ala Ile Leu
 195 200 205

Gly Ile Gly Asn Glu Ile Leu Asp Tyr Asp Leu Ala Ile Ala Glu Leu
 210 215 220

Ser Asn Asn Ile Asn Val Glu Asp Leu Gln Gln Leu Phe Ser Tyr Ser
 225 230 235 240

Glu Ser Thr Gln Arg Val Leu Leu Gln Thr Tyr Leu Asn Arg Phe Pro
 245 250 255

Asp Leu Asn Leu Thr Lys Ala Gln Phe Ala Glu Val Gln Gln Ile Leu
 260 265 270

Lys Ser Lys Ser Gln Tyr Arg His Pro Ile Lys Asn Gly Tyr Glu Leu
 275 280 285

Ile Lys Glu Tyr Gln Gln Phe Gln Ile Cys Lys Ile Ser Pro Gln Ala
 290 295 300

Asp Glu Lys Glu Asp Glu Leu Val Leu His Tyr Gln Asn Gln Val Ala
 305 310 315 320

Tyr Gln Gly Tyr Leu Phe Ser Phe Gly Leu Pro Leu Glu Gly Glu Leu
 325 330 335

Ile Gln Gln Ile Pro Val Ser Arg Glu Thr Ser Ile His Ile Arg His
 340 345 350

097697043604

Arg Lys Thr Gly Asp Val Leu Ile Lys Asn Gly His Arg Lys Lys Leu
 355 360 365

Arg Arg Leu Phe Ile Asp Leu Lys Ile Pro Met Glu Lys Arg Asn Ser
 370 375 380

Ala Leu Ile Ile Glu Gln Phe Gly Glu Ile Val Ser Ile Leu Gly Ile
 385 390 395 400

Ala Thr Asn Asn Leu Ser Lys Lys Thr Lys Asn Asp Ile Met Asn Thr
 405 410 415

Val Leu Tyr Ile Glu Lys Ile Asp Arg
 420 425

<210> 25

<211> 422

<212> PRT

<213> Streptococcus pneumoniae

<400> 25

Met Arg Lys Phe Leu Ile Ile Leu Leu Leu Pro Ser Phe Leu Thr Ile
 1 5 10 15

Ser Lys Val Val Ser Thr Glu Lys Glu Val Val Tyr Thr Ser Lys Glu
 20 25 30

Ile Tyr Tyr Leu Ser Gln Ser Asp Phe Gly Ile Tyr Phe Arg Glu Lys
 35 40 45

Leu Ser Ser Pro Met Val Tyr Gly Glu Val Pro Val Tyr Ala Asn Glu
 50 55 60

Asp Leu Val Val Glu Ser Gly Lys Leu Thr Pro Lys Thr Ser Phe Gln
 65 70 75 80

00660387 0360

65

Ile Thr Glu Trp Arg Leu Asn Lys Gln Gly Ile Pro Val Phe Lys Leu
85 90 95

Ser Asn His Gln Phe Ile Ala Ala Asp Lys Arg Phe Leu Tyr Asp Gln
100 105 110

Ser Glu Val Thr Pro Thr Ile Lys Lys Val Trp Leu Glu Ser Asp Phe
115 120 125

Lys Leu Tyr Asn Ser Pro Tyr Asp Leu Lys Glu Val Lys Ser Ser Leu
130 135 140

Ser Ala Tyr Ser Gln Val Ser Ile Asp Lys Thr Met Phe Val Glu Gly
145 150 155 160

Arg Glu Phe Leu His Ile Asp Gln Ala Gly Trp Val Ala Lys Glu Ser
165 170 175

Thr Ser Glu Glu Asp Asn Arg Met Ser Lys Val Gln Glu Met Leu Ser
180 185 190

Glu Lys Tyr Gln Lys Asp Ser Phe Ser Ile Tyr Val Lys Gln Leu Thr
195 200 205

Thr Gly Lys Glu Ala Gly Ile Asn Gln Asp Glu Lys Met Tyr Ala Ala
210 215 220

Ser Val Leu Lys Leu Ser Tyr Leu Tyr Tyr Thr Gln Glu Lys Ile Asn
225 230 235 240

Glu Gly Leu Tyr Gln Leu Asp Thr Thr Val Lys Tyr Val Ser Ala Val
245 250 255

Asn Asp Phe Pro Gly Ser Tyr Lys Pro Glu Gly Ser Gly Ser Leu Pro
260 265 270

Lys Lys Glu Asp Asn Lys Glu Tyr Ser Leu Lys Asp Leu Ile Thr Lys
275 280 285

003693-01360

Val Ser Lys Glu Ser Asp Asn Val Ala His Asn Leu Leu Gly Tyr Tyr
290 295 300

Ile Ser Asn Gln Ser Asp Ala Thr Phe Lys Ser Lys Met Ser Ala Ile
305 310 315 320

Met Gly Asp Asp Trp Asp Pro Lys Glu Lys Leu Ile Ser Ser Lys Met
325 330 335

Ala Gly Lys Phe Met Glu Ala Ile Tyr Asn Gln Asn Gly Phe Val Leu
340 345 350

Glu Ser Leu Thr Lys Thr Asp Phe Asp Ser Gln Arg Ile Ala Lys Gly
355 360 365

Val Ser Val Lys Val Ala His Lys Ile Gly Asp Ala Asp Glu Phe Lys
370 375 380

His Asp Thr Gly Val Val Tyr Ala Asp Ser Pro Phe Ile Leu Ser Ile
385 390 395 400

Phe Thr Lys Asn Ser Asp Tyr Asp Thr Ile Ser Lys Ile Ala Lys Asp
405 410 415

Val Tyr Glu Val Leu Lys
420

<210> 26

<211> 652

<212> PRT

<213> Streptococcus pneumoniae

<400> 26

Met Lys Lys Gln Asn Asn Gly Leu Ile Lys Asn Pro Phe Leu Trp Leu
1 5 10 15

00769789 043504

Leu Phe Ile Phe Phe Leu Val Thr Gly Phe Gln Tyr Phe Tyr Ser Gly
20 25 30

Asn Asn Ser Gly Gly Ser Gln Gln Ile Asn Tyr Thr Glu Leu Val Gln
35 40 45

Glu Ile Thr Asp Gly Asn Val Lys Glu Leu Thr Tyr Gln Pro Asn Gly
50 55 60

Ser Val Ile Glu Val Ser Gly Val Tyr Lys Asn Pro Lys Thr Ser Lys
65 70 75 80

Glu Glu Thr Gly Ile Gln Phe Phe Thr Pro Ser Val Thr Lys Val Glu
85 90 95

Lys Phe Thr Ser Thr Ile Leu Pro Ala Asp Thr Thr Val Ser Glu Leu
100 105 110

Gln Lys Leu Ala Thr Asp His Lys Ala Glu Val Thr Val Lys His Glu
115 120 125

Ser Ser Ser Gly Ile Trp Ile Asn Leu Leu Val Ser Ile Val Pro Phe
130 135 140

Gly Ile Leu Phe Phe Phe Leu Phe Ser Met Met Gly Asn Met Gly Gly
145 150 155 160

Gly Asn Gly Arg Asn Pro Met Ser Phe Gly Arg Ser Lys Ala Lys Ala
165 170 175

Ala Asn Lys Glu Asp Ile Lys Val Arg Phe Ser Asp Val Ala Gly Ala
180 185 190

Glu Glu Glu Lys Gln Glu Leu Val Glu Val Val Glu Phe Leu Lys Asp
195 200 205

Pro Lys Arg Phe Thr Lys Leu Gly Ala Arg Ile Pro Ala Gly Val Leu
210 215 220

005510 2829260

Leu Glu Gly Pro Pro Gly Thr Gly Lys Thr Leu Leu Ala Lys Ala Val
225 230 235 240

Ala Gly Glu Ala Gly Val Pro Phe Phe Ser Ile Ser Gly Ser Asp Phe
245 250 255

Val Glu Met Phe Val Gly Val Gly Ala Ser Arg Val Arg Ser Leu Phe
260 265 270

Glu Asp Ala Lys Lys Ala Ala Pro Ala Ile Ile Phe Ile Asp Glu Ile
275 280 285

Asp Ala Val Gly Arg Gln Arg Gly Val Gly Leu Gly Gly Gly Asn Asp
290 295 300

Glu Arg Glu Gln Thr Leu Asn Gln Leu Leu Ile Glu Met Asp Gly Phe
305 310 315 320

Glu Gly Asn Glu Gly Ile Ile Val Ile Ala Ala Thr Asn Arg Ser Asp
325 330 335

Val Leu Asp Pro Ala Leu Leu Arg Pro Gly Arg Phe Asp Arg Lys Val
340 345 350

Leu Val Gly Arg Pro Asp Val Lys Gly Arg Glu Ala Ile Leu Lys Val
355 360 365

His Ala Lys Asn Lys Pro Leu Ala Glu Asp Val Asp Leu Lys Leu Val
370 375 380

Ala Gln Gln Thr Pro Gly Phe Val Gly Ala Asp Leu Glu Asn Val Leu
385 390 395 400

Asn Glu Ala Ala Leu Val Ala Ala Arg Arg Asn Lys Ser Ile Ile Asp
405 410 415

Ala Ser Asp Ile Asp Glu Ala Glu Asp Arg Val Ile Ala Gly Pro Ser
420 425 430

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Lys Lys Asp Lys Thr Val Ser Gln Lys Glu Arg Glu Leu Val Ala Tyr
 435 440 445

His Glu Ala Gly His Thr Ile Val Gly Leu Val Leu Ser Asn Ala Arg
 450 455 460

Val Val His Lys Val Thr Ile Val Pro Arg Gly Arg Ala Gly Gly Tyr
 465 470 475 480

Met Ile Ala Leu Pro Lys Glu Asp Gln Met Leu Leu Ser Lys Glu Asp
 485 490 495

Met Lys Glu Gln Leu Ala Gly Leu Met Gly Gly Arg Val Ala Glu Glu
 500 505 510

Ile Ile Phe Asn Val Gln Thr Thr Gly Ala Ser Asn Asp Phe Glu Gln
 515 520 525

Ala Thr Gln Met Ala Arg Ala Met Val Thr Glu Tyr Gly Met Ser Glu
 530 535 540

Lys Leu Gly Pro Val Gln Tyr Glu Gly Asn His Ala Met Leu Gly Ala
 545 550 555 560

Gln Ser Pro Gln Lys Ser Ile Ser Glu Gln Thr Ala Tyr Glu Ile Asp
 565 570 575

Glu Glu Val Arg Ser Leu Leu Asn Glu Ala Arg Asn Lys Ala Ala Glu
 580 585 590

Ile Ile Gln Ser Asn Arg Glu Thr His Lys Leu Ile Ala Glu Ala Leu
 595 600 605

Leu Lys Tyr Glu Thr Leu Asp Ser Thr Gln Ile Lys Ala Leu Tyr Glu
 610 615 620

Thr Gly Lys Met Pro Glu Ala Val Glu Glu Glu Ser His Ala Leu Ser
 625 630 635 640

00759707-013604

645

650

<211> 563

<212> PRT

<213> Streptococcus pneumoniae

<400> 27

1

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75

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85

90

95

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120

125

130

135

140

Gly	Ala	Met	Pro	Val	Leu	Thr	Pro	Ala	Arg	Lys	Ser	Asp	Ser	Gln	Trp
145							150				155				160
Val	Ile	Ser	Val	Thr	Gln	Glu	Leu	Val	Asp	Ala	Lys	Gly	Ala	Asn	Leu
							165				170				175
Gly	Val	Leu	Arg	Leu	Asp	Ile	Ser	Tyr	Glu	Thr	Leu	Glu	Ala	Tyr	Leu
							180				185				190
Asn	Gln	Leu	Gln	Leu	Gly	Gln	Gln	Gly	Phe	Ala	Phe	Ile	Ile	Asn	Glu
							195				200				205
Asn	His	Glu	Phe	Val	Tyr	His	Pro	Gln	His	Thr	Val	Tyr	Ser	Ser	Ser
							210				215				220
Ser	Lys	Met	Glu	Ala	Met	Lys	Pro	Tyr	Ile	Asp	Thr	Gly	Gln	Gly	Tyr
							225				230				235
Thr	Pro	Gly	His	Lys	Ser	Tyr	Val	Ser	Gln	Glu	Lys	Ile	Ala	Gly	Thr
							245				250				255
Asp	Trp	Thr	Val	Leu	Gly	Val	Ser	Ser	Leu	Glu	Lys	Leu	Asp	Gln	Val
							260				265				270
Arg	Ser	Gln	Leu	Leu	Trp	Thr	Leu	Leu	Gly	Ala	Ser	Val	Thr	Ser	Leu
							275				280				285
Leu	Val	Cys	Leu	Cys	Leu	Val	Trp	Phe	Ser	Leu	Lys	Arg	Trp	Ile	Ala
							290				295				300
Pro	Leu	Lys	Asp	Leu	Arg	Glu	Thr	Met	Leu	Glu	Ile	Ala	Ser	Gly	Ala
							305				310				315
Gln	Asn	Leu	Arg	Ala	Lys	Glu	Val	Gly	Ala	Tyr	Glu	Leu	Arg	Glu	Val
							325				330				335
Thr	Arg	Gln	Phe	Asn	Ala	Met	Leu	Asp	Gln	Ile	Asp	Gln	Leu	Met	Val
							340				345				350

Ala Ile Arg Ser Gln Glu Glu Thr Thr Arg Gln Tyr Gln Leu Gln Ala
355 360 365

Leu Ser Ser Gln Ile Asn Pro His Phe Leu Tyr Asn Thr Leu Asp Thr
370 375 380

Ile Ile Trp Met Ala Glu Phe His Asp Ser Gln Arg Val Val Gln Val
385 390 395 400

Thr Lys Ser Leu Ala Thr Tyr Phe Arg Leu Ala Leu Asn Gln Gly Lys
405 410 415

Asp Leu Ile Cys Leu Ser Asp Glu Ile Asn His Val Arg Gln Tyr Leu
420 425 430

Phe Ile Gln Lys Gln Arg Tyr Gly Asp Lys Leu Glu Tyr Glu Ile Asn
435 440 445

Glu Asn Val Ala Phe Asp Asn Leu Val Leu Pro Lys Leu Val Leu Gln
450 455 460

Pro Leu Val Glu Asn Ala Leu Tyr His Gly Ile Lys Glu Lys Glu Gly
465 470 475 480

Gln Gly His Ile Lys Leu Ser Val Gln Lys Gln Asp Ser Gly Leu Val
485 490 495

Ile Arg Ile Glu Asp Asp Gly Val Gly Phe Gln Asp Ala Gly Asp Ser
500 505 510

Ser Gln Ser Gln Leu Lys Arg Gly Gly Val Gly Leu Gln Asn Val Asp
515 520 525

Gln Arg Leu Lys Leu His Phe Gly Ala Asn Tyr His Met Lys Ile Asp
530 535 540

Ser Arg Pro Gln Lys Gly Thr Lys Val Glu Ile Tyr Ile Asn Arg Ile
545 550 555 560

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105270 2929260

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<210> 28
<211> 563
<212> PRT
<213> Streptococcus pneumoniae
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Met Lys Arg Ser Ser Leu Leu Val Arg Met Val Ile Ser Ile Phe Leu
1 5 10 15

Ser Ser Ser Ala Ile Glu Ala Thr Ile Glu Gly Asn Ser Gln Thr Thr
35 40 45

Thr Thr Ser Thr Gly Leu Thr Gln Gln Thr Asp Val Leu Ala Tyr Ala
65 70 75 80

Thr Ile Leu Lys Ser Asp Lys Asp Leu Lys Thr Val Val Leu Val Thr
100 105 110

Ser Ser Asp Met Met Ala Glu Asp Trp Tyr Gln Lys Ala Ile His Gln
130 135 140

Gly Ala Met Pro Val Leu Thr Pro Ala Arg Lys Ser Asp Ser Gln Trp
 145 150 155 160

Val Ile Ser Val Thr Gln Glu Leu Val Asp Ala Lys Gly Ala Asn Leu
 165 170 175

Gly Val Leu Arg Leu Asp Ile Ser Tyr Glu Thr Leu Glu Ala Tyr Leu
 180 185 190

Asn Gln Leu Gln Leu Gly Gln Gln Gly Phe Ala Phe Ile Ile Asn Glu
 195 200 205

Asn His Glu Phe Val Tyr His Pro Gln His Thr Val Tyr Ser Ser Ser
 210 215 220

Ser Lys Met Glu Ala Met Lys Pro Tyr Ile Asp Thr Gly Gln Gly Tyr
 225 230 235 240

Thr Pro Gly His Lys Ser Tyr Val Ser Gln Glu Lys Ile Ala Gly Thr
 245 250 255

Asp Trp Thr Val Leu Gly Val Ser Ser Leu Glu Lys Leu Asp Gln Val
 260 265 270

Arg Ser Gln Leu Leu Trp Thr Leu Leu Gly Ala Ser Val Thr Ser Leu
 275 280 285

Leu Val Cys Leu Cys Leu Val Trp Phe Ser Leu Lys Arg Trp Ile Ala
 290 295 300

Pro Leu Lys Asp Leu Arg Glu Thr Met Leu Glu Ile Ala Ser Gly Ala
 305 310 315 320

Gln Asn Leu Arg Ala Lys Glu Val Gly Ala Tyr Glu Leu Arg Glu Val
 325 330 335

Thr Arg Gln Phe Asn Ala Met Leu Asp Gln Ile Asp Gln Leu Met Val
 340 345 350

005510 13269260

Ala Ile Arg Ser Gln Glu Glu Thr Thr Arg Gln Tyr Gln Leu Gln Ala
355 360 365

Leu Ser Ser Gln Ile Asn Pro His Phe Leu Tyr Asn Thr Leu Asp Thr
370 375 380

Ile Ile Trp Met Ala Glu Phe His Asp Ser Gln Arg Val Val Gln Val
385 390 395 400

Thr Lys Ser Leu Ala Thr Tyr Phe Arg Leu Ala Leu Asn Gln Gly Lys
405 410 415

Asp Leu Ile Cys Leu Ser Asp Glu Ile Asn His Val Arg Gln Tyr Leu
420 425 430

Phe Ile Gln Lys Gln Arg Tyr Gly Asp Lys Leu Glu Tyr Glu Ile Asn
435 440 445

Glu Asn Val Ala Phe Asp Asn Leu Val Leu Pro Lys Leu Val Leu Gln
450 455 460

Pro Leu Val Glu Asn Ala Leu Tyr His Gly Ile Lys Glu Lys Glu Gly
465 470 475 480

Gln Gly His Ile Lys Leu Ser Val Gln Lys Gln Asp Ser Gly Leu Val
485 490 495

Ile Arg Ile Glu Asp Asp Gly Val Gly Phe Gln Asp Ala Gly Asp Ser
500 505 510

Ser Gln Ser Gln Leu Lys Arg Gly Gly Val Gly Leu Gln Asn Val Asp
515 520 525

Gln Arg Leu Lys Leu His Phe Gly Ala Asn Tyr His Met Lys Ile Asp
530 535 540

Ser Arg Pro Gln Lys Gly Thr Lys Val Glu Ile Tyr Ile Asn Arg Ile
545 550 555 560

09760767 012504

Glu Thr Ser

<210> 29

<211> 379

<212> PRT

<213> Streptococcus pneumoniae

<400> 29

Met Phe Phe Lys Leu Leu Arg Glu Ala Leu Lys Val Lys Gln Val Arg

1 5 10 15

Ser Lys Ile Leu Phe Thr Ile Phe Ile Val Leu Val Phe Arg Ile Gly

20 25 30

Thr Ser Ile Thr Val Pro Gly Val Asn Ala Asn Ser Leu Asn Ala Leu

35 40 45

Ser Gly Leu Ser Phe Leu Asn Met Leu Ser Leu Val Ser Gly Asn Ala

50 55 60

Leu Lys Asn Phe Ser Ile Phe Ala Leu Gly Val Ser Pro Tyr Ile Thr

65 70 75 80

Ala Ser Ile Val Val Gln Leu Leu Gln Met Asp Ile Leu Pro Lys Phe

85 90 95

Val Glu Trp Gly Lys Gln Gly Glu Val Gly Arg Arg Lys Leu Asn Gln

100 105 110

Ala Thr Arg Tyr Ile Ala Leu Val Leu Ala Phe Val Gln Ser Ile Gly

115 120 125

Ile Thr Ala Gly Phe Asn Thr Leu Ala Gly Ala Gln Leu Ile Lys Thr

130 135 140

1099270 6526260

Glu Lys Ala Ala Glu Thr Tyr Lys Arg Val Val Pro Ile Ser Met Glu
340 345 350

Val Leu Gln Leu Leu Val Pro Ser Ser Leu Val
370 375

<211> 445

<212> PRT

<213> Streptococcus pneumoniae

<400> 30

Met Asp Ile Arg Gln Val Thr Glu Thr Ile Ala Met Ile Glu Glu Gln
1 5 10 15

Asn Phe Asp Ile Arg Thr Ile Thr Met Gly Ile Ser Leu Leu Asp Cys
20 25 30

Ile Asp Pro Asp Ile Asn Arg Ala Ala Glu Lys Ile Tyr Gln Lys Ile
35 40 45

Thr Thr Lys Ala Ala Asn Leu Val Ala Val Gly Asp Glu Ile Ala Ala
50 55 60

Glu Leu Gly Ile Pro Ile Val Asn Lys Arg Val Ser Val Thr Pro Ile
65 70 75 80

Ser Leu Ile Gly Ala Ala Thr Asp Ala Thr Asp Tyr Val Val Leu Ala
85 90 95

Lys Ala Leu Asp Lys Ala Ala Lys Glu Ile Gly Val Asp Phe Ile Gly
100 105 110

Gly Phe Ser Ala Leu Val Gln Lys Gly Tyr Gln Lys Gly Asp Glu Ile
115 120 125

Gly Gly Leu Ser Gly Ala Phe Ile Pro Val Ser Glu Asp Glu Gly Met
325 330 335

Ile Ala Ala Val Gln Asn Gly Ser Leu Asn Leu Glu Lys Leu Glu Ala
 340 345 350

Met Thr Ala Ile Cys Ser Val Gly Leu Asp Met Ile Ala Ile Pro Glu
 355 360 365

Asp Thr Pro Ala Glu Thr Ile Ala Ala Met Ile Ala Asp Glu Ala Ala
 370 375 380

Ile Gly Val Ile Asn Met Lys Thr Thr Ala Val Arg Ile Ile Pro Lys
 385 390 395 400

Gly Lys Glu Gly Asp Met Ile Glu Phe Gly Gly Leu Leu Gly Thr Ala
 405 410 415

Pro Val Met Lys Val Asn Gly Ala Ser Ser Val Asp Phe Ile Ser Arg
 420 425 430

Gly Gly Gln Ile Pro Ala Pro Ile His Ser Phe Lys Asn
 435 440 445

<210> 31

<211> 285

<212> PRT

<213> Streptococcus pneumoniae

<400> 31

Met Thr Gln Ile Ile Asp Gly Lys Ala Leu Ala Ala Lys Leu Gln Gly
 1 5 10 15

Gln Leu Ala Glu Lys Thr Ala Lys Leu Lys Glu Glu Thr Gly Leu Val
 20 25 30

Pro Gly Leu Val Val Ile Leu Val Gly Asp Asn Pro Ala Ser Gln Val
 35 40 45

005310 28269260

Gly Asp Val Asp Tyr Glu Ala Val Ala Pro Leu Ala Ser His Ile Thr
245 250 255

Pro Val Pro Gly Gly Val Gly Pro Met Thr Ile Thr Met Leu Met Glu
 260 265 270

Gln Thr Tyr Gln Ala Ala Leu Arg Thr Leu Asp Arg Lys
 275 280 285

<210> 32

<211> 403

<212> PRT

<213> Streptococcus pneumoniae

<400> 32

Met Ser Lys Phe Asn Arg Ile His Leu Val Val Leu Asp Ser Val Gly
 1 5 10 15

Ile Gly Ala Ala Pro Asp Ala Asn Asn Phe Val Asn Ala Gly Val Pro
 20 25 30

Asp Gly Ala Ser Asp Thr Leu Gly His Ile Ser Lys Thr Val Gly Leu
 35 40 45

Asn Val Pro Asn Met Ala Lys Ile Gly Leu Gly Asn Ile Pro Arg Glu
 50 55 60

Thr Pro Leu Lys Thr Val Ala Ala Glu Ser Asn Pro Thr Gly Tyr Ala
 65 70 75 80

Thr Lys Leu Glu Glu Val Ser Leu Gly Lys Asp Thr Met Thr Gly His
 85 90 95

Trp Glu Ile Met Gly Leu Asn Ile Thr Glu Pro Phe Asp Thr Phe Trp
 100 105 110

Asn Gly Phe Pro Glu Glu Ile Leu Thr Lys Ile Glu Glu Phe Ser Gly
 115 120 125

009999 019999 029999 039999 049999 059999 069999 079999 089999 099999

Arg Lys Val Ile Arg Glu Ala Asn Lys Pro Tyr Ser Gly Thr Ala Val
130 135 140

Ile Tyr Asp Phe Gly Pro Arg Gln Met Glu Thr Gly Glu Leu Ile Ile
145 150 155 160

Tyr Thr Ser Ala Asp Pro Val Leu Gln Ile Ala Ala His Glu Asp Ile
165 170 175

Ile Pro Leu Asp Glu Leu Tyr Arg Ile Cys Glu Tyr Ala Arg Ser Ile
180 185 190

Thr Leu Glu Arg Pro Ala Leu Leu Gly Arg Ile Ile Ala Arg Pro Tyr
195 200 205

Val Gly Glu Pro Gly Asn Phe Thr Arg Thr Ala Asn Arg Arg Asp Leu
210 215 220

Ala Val Ser Pro Phe Phe Pro Thr Val Leu Asp Lys Leu Asn Glu Ala
225 230 235 240

Gly Ile Asp Thr Tyr Ala Val Gly Lys Ile Asn Asp Ile Phe Asn Gly
245 250 255

Ala Gly Ile Asn His Asp Met Gly His Asn Lys Ser Asn Ser His Gly
260 265 270

Ile Asp Thr Leu Leu Lys Thr Met Gly Leu Ala Glu Phe Glu Lys Gly
275 280 285

Phe Ser Phe Thr Asn Leu Val Asp Phe Asp Ala Leu Tyr Gly His Arg
290 295 300

Arg Asn Ala His Gly Tyr Arg Asp Cys Leu His Glu Phe Asp Glu Arg
305 310 315 320

Leu Pro Glu Ile Ile Ala Ala Met Arg Glu Asn Asp Leu Leu Leu Ile
325 330 335

005550 28283260

85

Met Ile Leu Phe Ile Leu Val Leu Tyr Gly Leu Val Gly Phe Leu Asp
85 90 95

Asp Phe Leu Lys Val Phe Arg Lys Ile Asn Glu Gly Leu Asn Pro Lys
100 105 110

Gln Lys Leu Ala Leu Gln Leu Leu Gly Gly Val Ile Phe Tyr Leu Phe
115 120 125

Tyr Glu Arg Gly Gly Asp Ile Leu Ser Val Phe Gly Tyr Pro Val His
130 135 140

Leu Gly Phe Phe Tyr Ile Phe Phe Ala Leu Phe Trp Leu Val Gly Phe
145 150 155 160

Ser Asn Ala Val Asn Leu Thr Asp Gly Val Asp Gly Leu Ala Ser Ile
165 170 175

Ser Val Val Ile Ser Leu Ser Ala Tyr Gly Val Ile Ala Tyr Val Gln
180 185 190

Gly Gln Met Asp Ile Leu Leu Val Ile Leu Ala Met Ile Gly Gly Leu
195 200 205

Leu Gly Phe Phe Ile Phe Asn His Lys Pro Ala Lys Val Phe Met Gly
210 215 220

Asp Val Gly Ser Leu Ala Leu Gly Gly Met Leu Ala Ala Ile Ser Met
225 230 235 240

Ala Leu His Gln Glu Trp Thr Leu Leu Ile Ile Gly Ile Val Tyr Val
245 250 255

Phe Glu Thr Thr Ser Val Met Met Gln Val Ser Tyr Phe Lys Leu Thr
260 265 270

Gly Gly Lys Arg Ile Phe Arg Met Thr Pro Val His His His Phe Glu
275 280 285

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Leu Gly Gly Leu Ser Gly Lys Gly Asn Pro Trp Ser Glu Trp Lys Val
 290 295 300

Asp Phe Phe Phe Trp Gly Val Gly Leu Leu Ala Ser Leu Leu Thr Leu
 305 310 315 320

Ala Ile Leu Tyr Leu Met
 325

<210> 34

<211> 426

<212> PRT

<213> Streptococcus pneumoniae

<400> 34

Leu Phe Lys Lys Asn Lys Asp Ile Leu Asn Ile Ala Leu Pro Ala Met
 1 5 10 15

Gly Glu Asn Phe Leu Gln Met Leu Met Gly Met Val Asp Ser Tyr Leu
 20 25 30

Val Ala His Leu Gly Leu Ile Ala Ile Ser Gly Val Ser Val Ala Gly
 35 40 45

Asn Ile Ile Thr Ile Tyr Gln Ala Ile Phe Ile Ala Leu Gly Ala Ala
 50 55 60

Ile Ser Ser Val Ile Ser Lys Ser Ile Gly Gln Lys Asp Gln Ser Lys
 65 70 75 80

Leu Ala Tyr His Val Thr Glu Ala Leu Lys Ile Thr Leu Leu Leu Ser
 85 90 95

Phe Leu Leu Gly Phe Leu Ser Ile Phe Ala Gly Lys Glu Met Ile Gly
 100 105 110

105210 4269260

Leu Phe Leu Met Leu Pro Leu Ser Phe Ser Ile Tyr Val Leu Gly Val
305 310 315 320

Ala Thr Ala Leu Gly Tyr Ser Ala Glu Gln Leu Thr Tyr Leu Ile Ser
35 40 45

Thr Asp Ile Phe Met Cys Gly Val Ala Thr Phe Leu Gln Leu Gln Leu
50 55 60

Asn Lys Tyr Phe Gly Ile Gly Leu Pro Val Val Leu Gly Val Ala Phe
65 70 75 80

Gln Ser Val Ala Pro Leu Ile Met Ile Gly Gln Ser His Gly Ser Gly
85 90 95

Ala Met Phe Gly Ala Leu Ile Ala Ser Gly Ile Tyr Val Val Leu Val
100 105 110

Ser Gly Ile Phe Ser Lys Val Ala Asn Leu Phe Pro Ser Ile Val Thr
115 120 125

Gly Ser Val Ile Thr Thr Ile Gly Leu Thr Leu Ile Pro Val Ala Ile
130 135 140

Gly Asn Met Gly Asn Asn Val Pro Glu Pro Thr Gly Gln Ser Leu Leu
145 150 155 160

Leu Ala Ala Ile Thr Val Leu Ile Ile Leu Leu Ile Asn Ile Phe Thr
165 170 175

Lys Gly Phe Ile Lys Ser Ile Ser Ile Leu Ile Gly Leu Val Val Gly
180 185 190

Thr Ala Ile Ala Ala Thr Met Gly Leu Val Asp Phe Ser Pro Val Ala
195 200 205

Val Ala Pro Leu Val His Val Pro Thr Pro Leu Tyr Phe Gly Met Pro
210 215 220

Thr Phe Glu Ile Ser Ser Ile Val Met Met Cys Ile Ile Ala Thr Val
225 230 235 240

Ser Met Val Glu Ser Thr Gly Val Tyr Leu Ala Leu Ser Asp Ile Thr
245 250 255

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T09270 12626260

Lys Asp Pro Ile Asp Ser Thr Arg Leu Arg Asn Gly Tyr Arg Ala Glu
 260 265 270

Gly Leu Ala Val Leu Leu Gly Gly Ile Phe Asn Thr Phe Pro Tyr Thr
 275 280 285

Gly Phe Ser Gln Asn Val Gly Leu Val Lys Leu Ser Gly Ile Lys Lys
 290 295 300

Arg Leu Pro Ile Tyr Tyr Ala Ala Gly Phe Leu Val Leu Leu Gly Leu
 305 310 315 320

Leu Pro Lys Phe Gly Ala Leu Ala Gln Ile Ile Pro Ser Ser Val Leu
 325 330 335

Gly Gly Ala Met Leu Val Met Phe Gly Phe Val Ser Ile Gln Gly Met
 340 345 350

Gln Ile Leu Ala Arg Val Asp Phe Ala Asn Asn Glu His Asn Phe Leu
 355 360 365

Ile Ala Ala Val Ser Ile Ala Ala Gly Val Gly Leu Asn Asn Ser Asn
 370 375 380

Leu Phe Val Ser Met Pro Thr Ala Phe Gln Met Phe Phe Ser Asn Gly
 385 390 395 400

Ile Val Val Ala Ser Leu Leu Ala Ile Val Leu Asn Ala Val Leu Asn
 405 410 415

His Lys Lys Lys
 420

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<210> 36

<211> 784

<212> PRT

<213> Streptococcus pneumoniae

<400> 36

Met Lys Asp Arg Ile Lys Glu Tyr Leu Gln Asp Lys Gly Lys Val Thr

1

5

10

15

Val Asn Asp Leu Ala Gln Ala Leu Gly Lys Asp Ser Ser Lys Asp Phe

20

25

30

Arg Glu Leu Ile Lys Thr Leu Ser Leu Met Glu Arg Lys His Gln Ile

35

40

45

Arg Phe Glu Glu Asp Gly Ser Leu Thr Leu Glu Ile Lys Lys Lys His

50

55

60

Glu Ile Thr Leu Lys Gly Ile Phe His Ala His Lys Asn Gly Phe Gly

65

70

75

80

Phe Val Ser Leu Glu Gly Glu Glu Asp Asp Leu Phe Val Gly Lys Asn

85

90

95

Asp Val Asn Tyr Ala Ile Asp Gly Asp Thr Val Glu Val Val Ile Lys

100

105

110

Lys Val Ala Asp Arg Asn Lys Gly Thr Ala Ala Glu Ala Lys Ile Ile

115

120

125

Asp Ile Leu Glu His Ser Leu Thr Thr Val Val Gly Gln Ile Val Leu

130

135

140

Asp Gln Glu Lys Pro Lys Tyr Ala Gly Tyr Ile Arg Ser Lys Asn Gln

145

150

155

160

Lys Ile Ser Gln Pro Ile Tyr Val Lys Lys Pro Ala Leu Lys Leu Glu

165

170

175

092607 012601

Gly Thr Glu Val Leu Lys Val Phe Ile Asp Lys Tyr Pro Ser Lys Lys
 180 185 190

His Asp Phe Phe Val Ala Ser Val Leu Asp Val Val Gly His Ser Thr
 195 200 205

Asp Val Gly Ile Asp Val Leu Glu Val Leu Glu Ser Met Asp Ile Val
 210 215 220

Ser Glu Phe Pro Glu Ala Val Val Lys Glu Ala Glu Ser Val Pro Asp
 225 230 235 240

Ala Pro Ser Gln Lys Asp Met Glu Gly Arg Leu Asp Leu Arg Asp Glu
 245 250 255

Ile Thr Phe Thr Ile Asp Gly Ala Asp Ala Lys Asp Leu Asp Asp Ala
 260 265 270

Val His Ile Lys Ala Leu Lys Asn Gly Asn Leu Glu Phe Gly Val His
 275 280 285

Ile Ala Asp Val Ser Tyr Tyr Val Thr Glu Gly Ser Ala Leu Asp Lys
 290 295 300

Glu Ala Leu Asn Arg Ala Thr Ser Val Tyr Val Thr Asp Arg Val Val
 305 310 315 320

Pro Met Leu Pro Glu Arg Leu Ser Asn Gly Ile Cys Ser Leu Asn Pro
 325 330 335

Gln Val Asp Arg Leu Thr Gln Ser Ala Ile Met Glu Ile Asp Lys His
 340 345 350

Gly Arg Val Val Asn Tyr Thr Ile Thr Gln Thr Val Ile Lys Thr Ser
 355 360 365

Phe Arg Met Thr Tyr Ser Asp Val Asn Asp Ile Leu Ala Gly Asp Glu
 370 375 380

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Gly Arg Ser Lys Glu Ile Ala Glu His Phe Glu Gln Val Ile Pro Glu
580 585 590

Ile Ala Thr Gln Ser Ser Asn Arg Glu Arg Arg Ala Ile Glu Ala Glu
595 600 605

Arg Glu Val Glu Ala Met Lys Lys Ala Glu Tyr Met Glu Glu Tyr Val
610 615 620

Gly Glu Glu Tyr Asp Ala Val Val Ser Ser Ile Val Lys Phe Gly Leu
625 630 635 640

Phe Val Glu Leu Pro Asn Thr Val Glu Gly Leu Ile His Ile Thr Asn
645 650 655

Leu Pro Glu Phe Tyr His Phe Asn Glu Arg Asp Leu Thr Leu Arg Gly
660 665 670

Glu Lys Ser Gly Ile Thr Phe Arg Val Gly Gln Gln Ile Arg Ile Arg
675 680 685

Val Glu Arg Ala Asp Lys Met Thr Gly Glu Ile Asp Phe Ser Phe Val
690 695 700

Pro Ser Glu Phe Asp Val Ile Glu Lys Gly Leu Lys Gln Ser Ser Arg
705 710 715 720

Ser Gly Arg Gly Arg Asp Ser Asn Arg Arg Ser Asp Lys Lys Glu Asp
725 730 735

Lys Arg Lys Ser Gly Arg Ser Asn Asp Lys Arg Lys His Ser Gln Lys
740 745 750

Asp Lys Lys Lys Lys Gly Lys Lys Pro Phe Tyr Lys Glu Val Ala Lys
755 760 765

Lys Gly Ala Lys His Gly Lys Gly Arg Gly Lys Gly Arg Arg Thr Lys
770 775 780

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<210> 37

<211> 513

<212> PRT

<213> Streptococcus pneumoniae

<400> 37

Met Gly Thr Thr Gly Phe Thr Ile Ile Asp Leu Ile Ile Leu Ile Val

1

5

10

15

Tyr Leu Leu Ala Val Leu Val Ala Gly Ile Tyr Phe Ser Lys Lys Glu

20

25

30

Met Lys Gly Lys Glu Phe Phe Lys Gly Asp Gly Ser Val Pro Trp Tyr

35

40

45

Val Thr Ser Val Ser Ile Phe Ala Thr Met Leu Ser Pro Ile Ser Phe

50

55

60

Leu Gly Leu Ala Gly Ser Ser Tyr Ala Gly Ser Trp Ile Leu Trp Phe

65

70

75

80

Ala Gln Leu Gly Met Val Val Ala Ile Pro Leu Thr Ile Arg Phe Ile

85

90

95

Leu Pro Ile Phe Ala Arg Ile Asp Ile Asp Thr Ala Tyr Asp Tyr Leu

100

105

110

Asp Lys Arg Phe Asn Ser Lys Ala Leu Arg Ile Ile Ser Ala Leu Leu

115

120

125

Phe Ile Ile Tyr Gln Leu Gly Arg Met Ser Ile Ile Met Tyr Leu Pro

130

135

140

Ser Ala Gly Leu Ser Val Leu Thr Gly Ile Asp Ile Asn Ile Leu Ile

145

150

155

160

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Ser Val Ala Thr Ser Trp Thr Leu Asp Ile Gln Asp Val Ile Ser Lys
355 360 365

Ser Leu Ser Leu Cys Ala Tyr Ala Leu Asn Gln His Arg Ser Gln Glu
20 25 30

Asn Lys Asp Asn Asn Arg Val Ser Tyr Val Asp Gly Ser Gln Ser Ser
35 40 45

Gln Lys Ser Glu Asn Leu Thr Pro Asp Gln Val Ser Gln Lys Glu Gly
50 55 60

Ile Gln Ala Glu Gln Ile Val Ile Lys Ile Thr Asp Gln Gly Tyr Val
65 70 75 80

Thr Ser His Gly Asp His Tyr His Tyr Tyr Asn Gly Lys Val Pro Tyr
85 90 95

Asp Ala Leu Phe Ser Glu Glu Leu Leu Met Lys Asp Pro Asn Tyr Gln
100 105 110

Leu Lys Asp Ala Asp Ile Val Asn Glu Val Lys Gly Gly Tyr Ile Ile
115 120 125

Lys Val Asp Gly Lys Tyr Tyr Val Tyr Leu Lys Asp Ala Ala His Ala
130 135 140

Asp Asn Val Arg Thr Lys Asp Glu Ile Asn Arg Gln Lys Gln Glu His
145 150 155 160

Val Lys Asp Asn Glu Lys Val Asn Ser Asn Val Ala Val Ala Arg Ser
165 170 175

Gln Gly Arg Tyr Thr Thr Asn Asp Gly Tyr Val Phe Asn Pro Ala Asp
180 185 190

Ile Ile Glu Asp Thr Gly Asn Ala Tyr Ile Val Pro His Gly Gly His
195 200 205

Tyr His Tyr Ile Pro Lys Ser Asp Leu Ser Ala Ser Glu Leu Ala Ala
210 215 220

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Asn Ser Leu Ala Thr Pro Ser Pro Ser Leu Pro Ile Asn Pro Gly Thr
420 425 430

Lys His Met Glu Asp Ser Phe Trp Met Val Leu Gly Leu Thr Leu Ile
85 90 95

101

Ile Ala Gly Gly Leu Gly Asn Phe Ile Asp Arg Val Ser Gln Gly Phe
100 105 110

Val Val Asp Met Phe His Leu Asp Phe Ile Asn Phe Ala Ile Phe Asn
115 120 125

Val Ala Asp Ser Tyr Leu Thr Val Gly Val Ile Ile Leu Leu Ile Ala
130 135 140

Met Leu Lys Glu Glu Ile Asn Gly Asn
145 150

<210> 40

<211> 284

<212> PRT

<213> Streptococcus pneumoniae

<400> 40

Met Asn Thr Asn Leu Ala Ser Phe Ile Val Gly Leu Ile Ile Asp Glu
1 5 10 15

Asn Asp Arg Phe Tyr Phe Val Gln Lys Asp Gly Gln Thr Tyr Ala Leu
20 25 30

Ala Lys Glu Glu Gly Gln His Thr Val Gly Asp Thr Val Lys Gly Phe
35 40 45

Ala Tyr Thr Asp Met Lys Gln Lys Leu Arg Leu Thr Thr Leu Glu Val
50 55 60

Thr Ala Thr Gln Asp Gln Phe Gly Trp Gly Arg Val Thr Glu Val Arg
65 70 75 80

Lys Asp Leu Gly Val Phe Val Asp Thr Gly Leu Pro Asp Lys Glu Ile
85 90 95

105610 13463260

Lys Ile Lys Gln Asp Gln Phe Gly Thr Glu Leu Ile
275 280

<210> 41

<211> 394

<212> PRT

<213> Streptococcus pneumoniae

<400> 41

Met Lys Asp Val Ser Leu Phe Leu Leu Lys Lys Val Phe Lys Ser Arg

1

5

10

15

Leu Asn Trp Ile Val Leu Ala Leu Phe Val Ser Val Leu Gly Val Thr

20

25

30

Phe Tyr Leu Asn Ser Gln Thr Ala Asn Ser His Ser Leu Glu Ser Arg

35

40

45

Leu Glu Ser Arg Ile Ala Ala Asn Glu Arg Ala Ile Asn Glu Asn Glu

50

55

60

Glu Lys Leu Ser Gln Met Ser Asp Thr Ser Ser Glu Glu Tyr Gln Phe

65

70

75

80

Ala Lys Asn Asn Leu Asp Val Gln Lys Asn Leu Leu Thr Arg Lys Thr

85

90

95

Glu Ile Leu Thr Leu Leu Lys Glu Gly Arg Trp Lys Glu Ala Tyr Tyr

100

105

110

Leu Gln Trp Gln Asp Glu Glu Lys Asn Tyr Glu Phe Val Ser Asn Asp

115

120

125

Pro Thr Ala Ser Pro Gly Leu Lys Met Gly Val Asp Arg Glu Arg Lys

130

135

140

Ile Tyr Gln Ala Leu Tyr Pro Leu Asn Ile Lys Ala His Thr Leu Glu

145

150

155

160

Phe Pro Thr His Gly Ile Asp Gln Ile Val Trp Ile Leu Glu Val Ile

165

170

175

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104

Ile Pro Ser Leu Phe Val Val Ala Ile Ile Phe Met Leu Thr Gln Leu
180 185 190

Phe Ala Glu Arg Tyr Gln Asn His Leu Asp Thr Ala His Leu Tyr Pro
195 200 205

Val Ser Lys Val Thr Phe Ala Ile Ser Ser Leu Gly Val Gly Val Gly
210 215 220

Tyr Val Thr Val Leu Phe Ile Gly Ile Cys Gly Phe Ser Phe Leu Val
225 230 235 240

Gly Ser Leu Ile Ser Gly Phe Gly Gln Leu Asp Tyr Pro Tyr Pro Ile
245 250 255

Tyr Ser Leu Val Asn Gln Glu Val Thr Ile Gly Lys Ile Gln Asp Val
260 265 270

Leu Phe Pro Gly Leu Leu Leu Ala Phe Leu Ala Phe Ile Val Ile Val
275 280 285

Glu Val Val Tyr Leu Ile Ala Tyr Phe Phe Lys Gln Lys Met Pro Val
290 295 300

Leu Phe Leu Ser Leu Ile Gly Ile Val Gly Leu Leu Phe Gly Ile Gln
305 310 315 320

Thr Ile Gln Pro Leu Gln Arg Ile Ala His Leu Ile Pro Phe Thr Tyr
325 330 335

Leu Arg Ser Val Glu Ile Leu Ser Gly Arg Leu Pro Lys Gln Ile Asp
340 345 350

Asn Val Asp Leu Asn Trp Ser Met Gly Met Val Leu Leu Pro Cys Leu
355 360 365

Ile Ile Phe Leu Leu Leu Gly Ile Leu Phe Ile Glu Arg Trp Gly Ser
370 375 380

009697 009697 009697

Ser Gln Lys Lys Glu Phe Phe Asn Arg Phe
 385 390

<210> 42

<211> 448

<212> PRT

<213> Streptococcus pneumoniae

<400> 42

Met Met Lys Phe Ile Leu Asp Ile Val Ser Thr Pro Ala Ile Leu Val
 1 5 10 15

Ala Leu Ile Ala Ile Leu Gly Leu Val Leu Gln Lys Lys Lys Leu Pro
 20 25 30

Asp Ile Ile Lys Gly Gly Ile Lys Thr Phe Val Gly Phe Leu Val Val
 35 40 45

Ser Gly Gly Ala Gly Ile Val Gln Asn Ser Leu Asn Pro Phe Gly Thr
 50 55 60

Met Phe Glu His Ala Phe His Leu Ser Gly Val Val Pro Asn Asn Glu
 65 70 75 80

Ala Ile Val Ala Val Ala Leu Thr Thr Tyr Gly Ser Ala Thr Ala Met
 85 90 95

Ile Met Phe Ala Gly Met Val Phe Asn Ile Leu Ile Ala Arg Phe Thr
 100 105 110

Arg Phe Lys Tyr Ile Phe Leu Thr Gly His His Thr Leu Tyr Met Ala
 115 120 125

Cys Met Ile Ala Val Ile Leu Ser Val Ala Gly Phe Thr Ser Leu Pro
 130 135 140

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106

Leu Ile Leu Leu Gly Gly Leu Ala Leu Gly Ile Ile Met Ser Ile Ser
145 150 155 160

Pro Ala Phe Val Gln Lys Tyr Met Val Gln Leu Thr Gly Asn Asp Lys
165 170 175

Val Ala Leu Gly His Phe Ser Ser Leu Gly Tyr Trp Leu Ser Gly Phe
180 185 190

Thr Gly Ser Leu Ile Gly Asp Lys Ser Lys Ser Thr Glu Asp Ile Lys
195 200 205

Phe Pro Lys Ser Leu Ala Phe Leu Arg Asp Ser Thr Val Ser Ile Thr
210 215 220

Leu Ser Met Ala Val Ile Tyr Ile Ile Val Ala Ile Phe Ala Gly Ser
225 230 235 240

Glu Tyr Ile Glu Lys Glu Ile Ser Ser Gly Thr Ser Gly Leu Val Tyr
245 250 255

Ala Leu Gln Leu Ala Gly Gln Phe Ala Ala Gly Val Phe Val Ile Leu
260 265 270

Ala Gly Val Arg Leu Ile Leu Gly Glu Ile Val Pro Ala Phe Lys Gly
275 280 285

Ile Ser Glu Arg Leu Val Pro Asn Ser Lys Pro Ala Leu Asp Cys Pro
290 295 300

Ile Val Tyr Thr Tyr Ala Pro Asn Ala Val Leu Ile Gly Phe Ile Ser
305 310 315 320

Ser Phe Val Gly Gly Leu Val Ser Met Val Ile Met Ile Ala Ser Gly
325 330 335

Thr Val Val Ile Leu Pro Gly Val Val Pro His Phe Phe Cys Gly Ala
340 345 350

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T0969797 043604

107

Thr Ala Gly Val Ile Gly Asn Ala Ser Gly Gly Val Arg Gly Ala Thr
355 360 365

Ile Gly Ala Phe Leu Gln Gly Ile Leu Ile Ser Phe Leu Pro Val Phe
370 375 380

Leu Met Pro Val Leu Gly Gly Leu Gly Phe Gln Gly Ser Thr Phe Ser
385 390 395 400

Asp Ala Asp Phe Gly Leu Ser Gly Ile Ile Leu Gly Met Leu Asn Gln
405 410 415

Phe Gly Ser Gln Ala Gly Ile Val Ile Gly Leu Val Leu Ile Leu Ala
420 425 430

Val Met Phe Gly Val Ser Phe Ile Lys Lys Pro Ser Ala Thr Glu Glu
435 440 445

<210> 43

<211> 333

<212> PRT

<213> Streptococcus pneumoniae

<400> 43

Met Ile Lys Thr Phe Leu Ser Ala Leu Ser Val Ile Leu Phe Ser Ile
1 5 10 15

Pro Ile Ile Thr Tyr Ser Phe Phe Pro Ser Ser Asn Leu Asn Ile Trp
20 25 30

Leu Ser Thr Gln Pro Ile Leu Ala Gln Ile Tyr Ala Phe Pro Leu Ala
35 40 45

00693 0430
009310 0029260

His Asn Gln Leu Ala Ser Lys Tyr Pro Lys Ala Ile Ile Ala Gly Asp
245 250 255

Phe Asn Ala Thr Met Arg His Gly Ala Leu Ala Lys Ile Ser Ser His
260 265 270

Arg Asp Ala Leu Asn Ala Leu Pro Pro Phe Glu Arg Gly Thr Trp Asn
275 280 285

Ser Gln Ser Pro Lys Leu Phe Asn Ala Thr Ile Asp His Ile Leu Leu
290 295 300

Pro Lys Asn His Tyr Tyr Val Lys Asp Leu Asp Ile Val Ser Phe Gln
305 310 315 320

Asn Ser Asp His Arg Cys Ile Phe Thr Glu Ile Thr Phe
325 330

<210> 44

<211> 425

<212> PRT

<213> Streptococcus pneumoniae

<400> 44

Met Asn Pro Ile Gln Arg Ser Trp Ala Tyr Val Ser Arg Lys Arg Leu
1 5 10 15

Arg Ser Phe Ile Leu Phe Leu Ile Leu Leu Val Leu Leu Ala Gly Ile
20 25 30

Ser Ala Cys Leu Thr Leu Met Lys Ser Asn Lys Thr Val Glu Ser Asn
35 40 45

Leu Tyr Lys Ser Leu Asn Thr Ser Phe Ser Ile Lys Lys Ile Glu Asn
50 55 60

Gly Gln Thr Phe Lys Leu Ser Asp Leu Ala Ser Val Ser Lys Ile Lys
65 70 75 80

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[illegible]

Phe Glu Gln Ile Lys Asp Ser Val Ala Thr Phe Gln Thr Phe Leu Thr
275 280 285

Ile Val Ile Phe Leu Ile Ile Leu Leu Met Ala Ser Leu Ser Leu Val
20 25 30

Asn Thr Ala Ile Thr Asp Ile His Thr Ala Ala Lys Leu Tyr Gly Tyr
225 230 235 240

113

Thr Glu Asp Thr Ala Ile Tyr Gly Asp Ala Thr Phe Phe Val Thr Ala
245 250 255

Asp Lys Asn Leu Asp Asp Val Met Lys Glu Leu Asn Gly Ile Ser Gly
260 265 270

Ile Asn Trp Lys Ser Tyr Thr Leu Val Lys Ser Ser Ser Asn Tyr Pro
275 280 285

Ala Leu Glu Gln Ser Ile Ser Gly Met Tyr Lys Met Ala Asn Leu Leu
290 295 300

Phe Trp Gly Ser Leu Ser Phe Ser Val Leu Leu Leu Ala Leu Leu Leu
305 310 315 320

Ser Leu Trp Ile Asn Ala Arg Arg Lys Glu Val Gly Ile Leu Leu Ser
325 330 335

Ile Gly Leu Lys Gln Ala Ser Ile Leu Gly Gln Phe Ile Thr Glu Ser
340 345 350

Ile Leu Ile Ala Ile Pro Ala Leu Val Ser Ala Tyr Phe Leu Ala Asn
355 360 365

Tyr Thr Ala Arg Ala Ile Gly Asn Thr Val Leu Ala Asn Val Thr Ser
370 375 380

Gly Val Ala Lys Gln Ala Ser Lys Ala Ala Gln Ala Ser Asn Leu Gly
385 390 395 400

Gly Gly Ala Glu Val Asp Gly Phe Ser Lys Thr Leu Ser Ser Leu Asp
405 410 415

Ile Ser Ile Gln Thr Ser Asp Phe Ile Ile Ile Phe Val Leu Ala Leu
420 425 430

Val Leu Val Val Leu Val Met Ala Leu Ala Ser Ser Asn Leu Leu Arg
435 440 445

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Lys Gln Pro Lys Glu Leu Leu Leu Asp Gly Glu

450

455

<210> 46

<211> 205

<212> PRT

<213> Streptococcus pneumoniae

<400> 46

Met Ser Gln Asp Lys Gln Met Lys Ala Val Ser Pro Leu Leu Gln Arg

1

5

10

15

Val Ile Asn Ile Ser Ser Ile Val Gly Gly Val Gly Ser Leu Ile Phe

20

25

30

Cys Ile Trp Ala Tyr Gln Ala Gly Ile Leu Gln Ser Lys Glu Thr Leu

35

40

45

Ser Ala Phe Ile Gln Gln Ala Gly Ile Trp Gly Pro Pro Leu Phe Ile

50

55

60

Phe Leu Gln Ile Leu Gln Thr Val Val Pro Ile Ile Pro Gly Ala Leu

65

70

75

80

Thr Ser Val Ala Gly Val Phe Ile Tyr Gly His Ile Ile Gly Thr Ile

85

90

95

Tyr Asn Tyr Ile Gly Ile Val Ile Gly Cys Ala Ile Ile Phe Tyr Leu

100

105

110

Val Arg Leu Tyr Gly Ala Ala Phe Val Gln Ser Val Val Ser Lys Arg

115

120

125

Thr Tyr Asp Lys Tyr Ile Asp Trp Leu Asp Lys Gly Asn Arg Phe Asp

130

135

140

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Figure 1 displays 12 histograms, labeled x_0 through x_{11} , showing the distribution of the number of non-zero elements in the vector x_k . The x-axis represents the number of non-zero elements (0 to 10), and the y-axis represents the count (0 to 10). The distributions are roughly bell-shaped and centered around 5, with the peak count increasing from 10 at x_0 to 12 at x_{11} .

Ala Lys Glu Ala Ile Lys Glu Glu Lys Leu Lys Gly Tyr Leu Thr Ile
85 90 95

116

Asp Gln Glu Asp Ser Val Leu Lys Ala Val Tyr His Gly Glu Thr Ser
100 105 110

Leu Glu Asn Gly Ile Lys Phe Glu Val Thr Gly Thr Leu Asn Glu Leu
115 120 125

Gln Asn Gln Leu Asn Arg Ser Thr Ala Ser Leu Ser Gln Glu Gln Glu
130 135 140

Lys Arg Leu Ala Gln Thr Ile Gln Phe Thr Glu Lys Ile Asp Glu Ala
145 150 155 160

Lys Glu Asn Lys Lys Phe Ile Gln Thr Ile Ala Ala Gly Ala Leu Gly
165 170 175

Phe Phe Leu Tyr Met Ile Leu Ile Thr Tyr Ala Gly Val Thr Ala Gln
180 185 190

Glu Val Ala Ser Glu Lys Gly Thr Lys Ile Met Glu Val Val Phe Ser
195 200 205

Ser Ile Arg Ala Ser His Tyr Phe Tyr Ala Arg Met Met Ala Leu Phe
210 215 220

Leu Val Ile Leu Thr His Ile Gly Ile Tyr Val Val Gly Gly Leu Ala
225 230 235 240

Ala Val Leu Leu Phe Lys Asp Leu Pro Phe Leu Ala Gln Ser Gly Ile
245 250 255

Leu Asp His Leu Gly Asp Ala Ile Ser Leu Asn Thr Leu Leu Phe Ile
260 265 270

Leu Ile Ser Leu Phe Met Tyr Val Val Leu Ala Ala Phe Leu Gly Ser
275 280 285

Met Val Ser Arg Pro Glu Asp Ser Gly Lys Ala Leu Ser Pro Leu Met
290 295 300

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117

Ile Leu Ile Met Gly Gly Phe Phe Gly Val Thr Ala Leu Gly Ala Ala
305 310 315 320

Gly Asp Asn Leu Leu Leu Lys Ile Gly Ser Tyr Ile Pro Phe Ile Ser
325 330 335

Thr Phe Phe Met Pro Phe Arg Thr Ile Asn Asp Tyr Ala Gly Gly Ala
340 345 350

Glu Ala Trp Ile Ser Leu Ala Ile Thr Val Ile Phe Ala Val Val Ala
355 360 365

Thr Gly Phe Ile Gly Arg Met Tyr Ala Ser Leu Val Leu Gln Thr Asp
370 375 380

Asp Leu Gly Ile Trp Lys Thr Phe Lys Arg Ala Leu Ser Tyr Lys
385 390 395

<210> 48

<211> 438

<212> PRT

<213> Streptococcus pneumoniae

<400> 48

Met Thr Glu Thr Ile Lys Leu Met Lys Ala His Thr Ser Val Arg Arg
1 5 10 15

Phe Lys Glu Gln Glu Ile Pro Gln Val Asp Leu Asn Glu Ile Leu Thr
20 25 30

Ala Ala Gln Met Ala Ser Ser Trp Lys Asn Phe Gln Ser Tyr Ser Val
35 40 45

Ile Val Val Arg Ser Gln Glu Lys Lys Asp Ala Leu Tyr Glu Leu Val
50 55 60

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118

Pro Gln Glu Ala Ile Arg Gln Ser Ala Val Phe Leu Leu Phe Val Gly
65 70 75 80

Asp Leu Asn Arg Ala Glu Lys Gly Ala Arg Leu His Thr Asp Thr Phe
85 90 95

Gln Pro Gln Gly Val Glu Gly Leu Leu Ile Ser Ser Val Asp Ala Ala
100 105 110

Leu Ala Gly Gln Asn Ala Leu Leu Ala Ala Glu Ser Leu Gly Tyr Gly
115 120 125

Gly Val Ile Ile Gly Leu Val Arg Tyr Lys Ser Glu Glu Val Ala Glu
130 135 140

Leu Phe Asn Leu Pro Asp Tyr Thr Tyr Ser Val Phe Gly Met Ala Leu
145 150 155 160

Gly Val Pro Asn Gln His His Asp Met Lys Pro Arg Leu Pro Leu Glu
165 170 175

Asn Val Val Phe Glu Glu Glu Tyr Gln Glu Gln Ser Thr Glu Ala Ile
180 185 190

Gln Ala Tyr Asp Arg Val Gln Ala Asp Tyr Ala Gly Ala Arg Ala Thr
195 200 205

Thr Ser Trp Ser Gln Arg Leu Ala Glu Gln Phe Gly Gln Ala Glu Pro
210 215 220

Ser Ser Thr Arg Lys Asn Leu Glu Gln Lys Lys Leu Leu Met Leu Lys
225 230 235 240

Leu Ile Ala Ile Val Gly Thr Asn Ser Lys Arg Ser Thr Asn Arg Gln
245 250 255

Leu Leu Gln Tyr Met Gln Lys His Phe Thr Asp Lys Ala Glu Ile Glu
260 265 270

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Phe Asp Trp Glu Asn Leu
435

120

<210> 49

<211> 280

<212> PRT

<213> Streptococcus pneumoniae

<400> 49

Met Asn Thr Tyr Gln Leu Asn Asn Gly Val Glu Ile Pro Val Leu Gly

1

5

10

15

Phe Gly Thr Phe Lys Ala Lys Asp Gly Glu Glu Ala Tyr Arg Ala Val

20

25

30

Leu Glu Ala Leu Lys Ala Gly Tyr Arg His Ile Asp Thr Ala Ala Ile

35

40

45

Tyr Gln Asn Glu Glu Ser Val Gly Gln Ala Ile Lys Asp Ser Gly Val

50

55

60

Pro Arg Glu Glu Met Phe Val Thr Thr Lys Leu Trp Asn Ser Gln Gln

65

70

75

80

Thr Tyr Glu Gln Thr Arg Gln Ala Leu Glu Lys Ser Ile Glu Lys Leu

85

90

95

Gly Leu Asp Tyr Leu Asp Leu Tyr Leu Ile His Trp Pro Asn Pro Lys

100

105

110

Pro Leu Arg Glu Asn Asp Ala Trp Lys Thr Arg Asn Ala Glu Val Trp

115

120

125

Arg Ala Met Glu Asp Leu Tyr Gln Glu Gly Lys Ile Arg Ala Ile Gly

130

135

140

Val Ser Asn Phe Leu Pro His His Leu Asp Ala Leu Leu Glu Thr Ala

145

150

155

160

Thr Ile Val Pro Ala Val Asn Gln Val Arg Leu Ala Pro Gly Val Tyr

165

170

175

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[illegible]

Val Tyr Leu Thr Met Lys Glu Ala Pro Arg Lys Lys Ile Ile Pro Asp
35 40 45

122

Asp Ile Leu Asp Phe Ile Leu Val Ala Phe Pro Leu Ala Ile Leu Gly
50 55 60

Ala Arg Leu Tyr Tyr Val Ile Phe Arg Phe Asp Tyr Tyr Ser Gln Asn
65 70 75 80

Leu Gly Glu Ile Phe Ala Ile Trp Asn Gly Gly Leu Ala Ile Tyr Gly
85 90 95

Gly Leu Ile Thr Gly Ala Leu Val Leu Tyr Ile Phe Ala Asp Arg Lys
100 105 110

Leu Ile Asn Thr Trp Asp Phe Leu Asp Ile Ala Ala Pro Ser Val Met
115 120 125

Ile Ala Gln Ser Leu Gly Arg Trp Gly Asn Phe Phe Asn Gln Glu Ala
130 135 140

Tyr Gly Ala Thr Val Asp Asn Leu Asp Tyr Leu Pro Gly Phe Ile Arg
145 150 155 160

Asp Gln Met Tyr Ile Glu Gly Ser Tyr Arg Gln Pro Thr Phe Leu Tyr
165 170 175

Glu Ser Leu Trp Asn Leu Leu Gly Phe Ala Leu Ile Leu Ile Phe Arg
180 185 190

Arg Lys Trp Lys Ser Leu Arg Arg Gly His Ile Thr Ala Phe Tyr Leu
195 200 205

Ile Trp Tyr Gly Phe Gly Arg Met Val Ile Glu Gly Met Arg Thr Asp
210 215 220

Ser Leu Met Phe Phe Gly Phe Arg Val Ser Gln Trp Leu Ser Val Val
225 230 235 240

Leu Ile Gly Leu Gly Ile Met Ile Val Ile Tyr Gln Asn Arg Lys Lys
245 250 255

105000-0000000000

123

Ala Pro Tyr Tyr Ile Thr Glu Glu Glu Asn

260

265

<210> 51

<211> 129

<212> PRT

<213> Streptococcus pneumoniae

<400> 51

Met Gly Lys Leu Ser Ser Ile Leu Leu Gly Thr Val Ser Gly Ala Ala

1

5

10

15

Leu Ala Leu Phe Leu Thr Ser Asp Lys Gly Lys Gln Val Cys Ser Gln

20

25

30

Ala Gln Asp Phe Leu Asp Asp Leu Arg Glu Asp Pro Glu Tyr Ala Lys

35

40

45

Glu Gln Val Cys Glu Lys Leu Thr Glu Val Lys Glu Gln Ala Thr Asp

50

55

60

Phe Val Leu Lys Thr Lys Glu Gln Val Glu Ser Gly Glu Ile Thr Val

65

70

75

80

Asp Ser Ile Leu Ala Gln Thr Lys Ser Tyr Ala Phe Gln Ala Thr Glu

85

90

95

Ala Ser Lys Asn Gln Leu Asn Asn Leu Lys Glu Gln Trp Gln Glu Lys

100

105

110

Ala Glu Ala Leu Asp Asp Ser Glu Glu Ile Val Ile Asp Ile Thr Glu

115

120

125

Glu

<210> 52

<211> 205

<212> PRT

<213> Streptococcus pneumoniae

<400> 52

Met Lys Thr Lys Leu Ile Phe Trp Gly Ser Met Leu Phe Leu Leu Ser

1

5

10

15

Leu Ser Ile Leu Leu Thr Ile Tyr Leu Ala Trp Ile Phe Tyr Pro Met

20

25

30

Glu Ile Gln Trp Leu Asn Leu Thr Asn Arg Val Tyr Leu Lys Pro Glu

35

40

45

Thr Ile Gln Tyr Asn Phe His Ile Leu Met Asn Tyr Leu Thr Asn Pro

50

55

60

Phe Ser Gln Val Leu Gln Met Pro Asp Phe Arg Ser Ser Ala Ala Gly

65

70

75

80

Leu His His Phe Ala Val Val Lys Asn Leu Phe His Leu Val Gln Leu

85

90

95

Val Ala Leu Val Thr Leu Pro Ser Phe Tyr Val Phe Val Asn Arg Ile

100

105

110

Val Lys Lys Asp Phe Leu Ser Leu Tyr Arg Lys Ser Leu Leu Ala Leu

115

120

125

Val Val Leu Pro Val Met Ile Gly Leu Gly Gly Val Leu Ile Gly Phe

130

135

140

Asp Gln Phe Phe Thr Leu Phe His Gln Ile Leu Phe Val Gly Asp Asp

145

150

155

160

Thr Trp Leu Phe Asp Pro Ala Lys Asp Pro Val Ile Met Ile Leu Pro

165

170

175

TOGETHER 12469260

125

Glu Thr Phe Phe Leu His Ala Phe Leu Leu Phe Phe Ala Leu Tyr Glu
180 185 190

Asn Phe Phe Gly Tyr Leu Tyr Leu Lys Ser Arg Arg Lys
195 200 205

<210> 53

<211> 637

<212> PRT

<213> Streptococcus pneumoniae

<400> 53

Met Thr Tyr His Phe Thr Glu Glu Tyr Asp Ile Ile Val Ile Gly Ala
1 5 10 15

Gly His Ala Gly Val Glu Ala Ser Leu Ala Ala Ser Arg Met Gly Cys
20 25 30

Lys Val Leu Leu Ala Thr Ile Asn Ile Glu Met Leu Ala Phe Met Pro
35 40 45

Cys Asn Pro Ser Ile Gly Gly Ser Ala Lys Gly Ile Val Val Arg Glu
50 55 60

Val Asp Ala Leu Gly Gly Glu Met Ala Lys Thr Ile Asp Lys Thr Tyr
65 70 75 80

Ile Gln Met Lys Met Leu Asn Thr Gly Lys Gly Pro Ala Val Arg Ala
85 90 95

Leu Arg Ala Gln Ala Asp Lys Glu Leu Tyr Ser Lys Glu Met Arg Lys
100 105 110

Thr Val Glu Asn Gln Glu Asn Leu Thr Leu Arg Gln Thr Met Ile Asp
115 120 125

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[illegible]

Glu Asp Val Gln Arg Asp Leu Val His Ser Ile Lys Gly Leu Glu Asn
325 330 335

Ala Glu Met Met Arg Thr Gly Tyr Ala Ile Glu Tyr Asp Met Val Leu
340 345 350

Pro His Gln Leu Arg Ala Thr Leu Glu Thr Lys Lys Ile Ser Gly Leu
355 360 365

Phe Thr Ala Gly Gln Thr Asn Gly Thr Ser Gly Tyr Glu Glu Ala Ala
370 375 380

Gly Gln Gly Ile Ile Ala Gly Ile Asn Ala Ala Leu Lys Ile Gln Gly
385 390 395 400

Lys Pro Glu Leu Ile Leu Lys Arg Ser Asp Gly Tyr Ile Gly Val Met
405 410 415

Ile Asp Asp Leu Val Thr Lys Gly Thr Ile Glu Pro Tyr Arg Leu Leu
420 425 430

Thr Ser Arg Ala Glu Tyr Arg Leu Ile Leu Arg His Asp Asn Ala Asp
435 440 445

Met Arg Leu Thr Glu Met Gly Arg Glu Ile Gly Leu Val Asp Asp Glu
450 455 460

Arg Trp Ala Arg Phe Glu Ile Lys Lys Asn Gln Phe Asp Asn Glu Met
465 470 475 480

Lys Arg Leu Asp Ser Ile Lys Leu Lys Pro Val Lys Glu Thr Asn Ala
485 490 495

Lys Val Glu Glu Met Gly Phe Lys Pro Leu Thr Asp Ala Val Thr Ala
500 505 510

Lys Glu Phe Leu Arg Arg Pro Glu Val Ser Tyr Gln Asp Val Val Ala
515 520 525

Phe Ile Gly Pro Ala Ala Glu Asp Leu Asp Asp Lys Ile Ile Glu Leu
530 535 540

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128

Ile Glu Thr Glu Ile Lys Tyr Glu Gly Tyr Ile Ser Lys Ala Met Asp
545 550 555 560

Gln Val Ala Lys Met Lys Arg Met Glu Glu Lys Arg Ile Pro Ala Asn
565 570 575

Ile Asp Trp Asp Asp Ile Asp Ser Ile Ala Thr Glu Ala Arg Gln Lys
580 585 590

Phe Lys Leu Ile Asn Pro Glu Thr Ile Gly Gln Ala Ser Arg Ile Ser
595 600 605

Gly Val Asn Pro Ala Asp Ile Ser Ile Leu Met Val Tyr Leu Glu Gly
610 615 620

Lys Asn Arg Ser Ile Ser Lys Thr Leu Gln Lys Ser Lys
625 630 635

<210> 54

<211> 185

<212> PRT

<213> Streptococcus pneumoniae

<400> 54

Met Thr Lys Gln Val Leu Leu Val Asp Asp Glu Glu His Ile Leu Lys
1 5 10 15

Leu Leu Asp Tyr His Leu Ser Lys Glu Gly Phe Ser Thr Gln Leu Val
20 25 30

Thr Asn Gly Arg Lys Ala Leu Ala Leu Ala Glu Thr Glu Pro Phe Asp
35 40 45

Phe Ile Leu Leu Asp Ile Met Leu Pro Gln Leu Asp Gly Met Glu Val
50 55 60

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129

Cys Lys Arg Leu Arg Ala Lys Gly Val Lys Thr Pro Ile Met Met Val
65 70 75 80

Ser Ala Lys Ser Asp Glu Phe Asp Lys Val Leu Ala Leu Glu Leu Gly
85 90 95

Ala Asp Asp Tyr Leu Thr Lys Pro Phe Ser Pro Arg Glu Leu Leu Ala
100 105 110

Arg Val Lys Ala Val Leu Arg Arg Thr Lys Gly Glu Gln Glu Gly Asp
115 120 125

Asp Ser Asp Asn Ile Ala Asp Asp Ser Trp Leu Phe Gly Thr Leu Lys
130 135 140

Val Tyr Pro Glu Arg His Glu Val Tyr Lys Ala Asn Lys Leu Leu Ser
145 150 155 160

Leu Thr Pro Lys Glu Phe Glu Ser Asp Lys Asn Pro Phe Phe Glu Val
165 170 175

Phe Lys Val Ser Lys Val Thr Ala Gln
180 185

<210> 55

<211> 478

<212> PRT

<213> Streptococcus pneumoniae

<400> 55

Met Thr Thr Phe Lys Asp Gly Phe Leu Trp Gly Gly Ala Val Ala Ala
1 5 10 15

His Gln Leu Glu Gly Gly Trp Gln Glu Gly Gly Lys Gly Ile Ser Val
20 25 30

130

Ala Asp Val Met Thr Ala Gly Arg His Gly Val Ala Arg Glu Ile Thr
35 40 45

Leu Gly Val Leu Glu Gly Lys Tyr Tyr Pro Asn His Glu Ala Ile Asp
50 55 60

Phe Tyr His Arg Tyr Lys Glu Asp Ile Ala Leu Phe Ala Glu Met Gly
65 70 75 80

Phe Lys Cys Phe Arg Thr Ser Ile Ala Trp Thr Arg Ile Phe Pro Lys
85 90 95

Gly Asp Glu Leu Glu Pro Asn Glu Glu Gly Leu Gln Phe Tyr Asp Asn
100 105 110

Leu Phe Asp Glu Cys Leu Lys Asn Gly Ile Glu Pro Val Ile Thr Leu
115 120 125

Ser His Phe Glu Met Pro Tyr His Leu Val Thr Glu Tyr Gly Gly Trp
130 135 140

Lys Asn Arg Lys Leu Ile Asp Phe Phe Ala Arg Phe Ala Glu Val Val
145 150 155 160

Phe Lys Arg Tyr Lys Asp Lys Val Lys Tyr Trp Met Thr Phe Asn Glu
165 170 175

Ile Asn Asn Gln Ala Asn Tyr Gln Glu Asp Phe Ala Pro Phe Thr Asn
180 185 190

Ser Gly Ile Val Tyr Glu Glu Gly Asp Asn Arg Glu Ala Ile Met Tyr
195 200 205

Gln Ala Ala His Tyr Glu Leu Val Ala Ser Ala Arg Ala Val Lys Ile
210 215 220

Gly His Glu Ile Asn Pro Asp Phe Gln Ile Gly Cys Met Ile Ala Met
225 230 235 240

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T09270-16269260

131

Cys Pro Ile Tyr Pro Val Thr Cys Asn Pro Lys Asp Ile Leu Met Ala
245 250 255

Met Lys Ala Met Gln Lys Arg Tyr Tyr Phe Ala Asp Val His Val Leu
260 265 270

Gly Lys Tyr Pro Glu His Ile Phe Lys Tyr Trp Glu Arg Lys Gly Ile
275 280 285

Ser Val Asp Phe Thr Ala Gln Asp Lys Glu Asp Leu Leu Gly Gly Thr
290 295 300

Val Asp Tyr Ile Gly Phe Ser Tyr Tyr Met Ser Phe Ala Ile Asp Ser
305 310 315 320

His Arg Glu Asn Asn Pro Tyr Phe Asp Tyr Leu Glu Thr Glu Asp Leu
325 330 335

Val Lys Asn Asn Tyr Val Lys Ala Ser Glu Trp Glu Trp Gln Ile Asp
340 345 350

Pro Glu Gly Leu Arg Tyr Ala Leu Asn Trp Phe Thr Asp His Tyr His
355 360 365

Leu Pro Leu Phe Ile Val Glu Asn Gly Phe Gly Ala Ile Asp Gln Val
370 375 380

Ala Ala Asp Gly Met Val His Asp Asp Tyr Arg Ile Glu Tyr Leu Gly
385 390 395 400

Ala His Ile Arg Glu Met Lys Lys Ala Val Val Glu Asp Gly Val Asp
405 410 415

Leu Met Gly Tyr Thr Pro Trp Gly Cys Ile Asp Leu Val Ser Ala Gly
420 425 430

Thr Gly Glu Met Arg Lys Arg Tyr Gly Phe Ile Tyr Val Asp Lys Asp
435 440 445

131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000

Asp Asn Gly Lys Gly Ser Tyr Asn Arg Ser Pro Lys Lys Ser Phe Gly
 450 455 460

Trp Tyr Lys Glu Val Ile Ser Ser Asn Gly Glu Ser Val Glu
 465 470 475

<210> 56

<211> 448

<212> PRT

<213> Streptococcus pneumoniae

<400> 56

Met Asp Gln Gln Asn Gly Leu Phe Gly Phe Leu Glu Asn His Val Met
 1 5 10 15

Gly Pro Met Gly Lys Leu Ala Gln Phe Lys Val Val Arg Ala Ile Thr
 20 25 30

Ala Ala Gly Met Ala Ala Val Pro Phe Thr Ile Val Gly Ser Met Phe
 35 40 45

Leu Val Phe Ser Ile Leu Pro Gln Ala Phe Ser Phe Trp Pro Ile Val
 50 55 60

Ala Asp Ile Phe Ser Ala Ser Phe Asp Lys Phe Thr Ser Leu Tyr Met
 65 70 75 80

Val Ala Asn Tyr Ala Thr Met Gly Ser Leu Ser Leu Tyr Phe Val Leu
 85 90 95

Ser Leu Ala Tyr Glu Leu Thr Lys Ile Tyr Ala Glu Glu Glu Glu Leu
 100 105 110

Asn Met Asn Pro Leu Asn Gly Ala Leu Leu Ala Leu Met Ala Phe Val
 115 120 125

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133

Met Thr Val Pro Gln Ile Ile Phe Asp Gly Gly Met Met Lys Thr Val
130 135 140

Thr Ser Leu Lys Glu Gly Ala Val Ile Ala Asp Gly Trp Ala Met Gly
145 150 155 160

Asn Val Val Ala Arg Phe Gly Thr Thr Gly Ile Phe Thr Ala Ile Ile
165 170 175

Met Ala Ile Val Thr Val Leu Ile Tyr Arg Met Cys Val Lys His Asn
180 185 190

Trp Val Ile Lys Met Pro Glu Ala Val Pro Glu Gly Val Ser Arg Gly
195 200 205

Phe Thr Ala Leu Val Pro Gly Phe Val Val Ala Phe Val Val Ile Phe
210 215 220

Ile Asn Gly Leu Leu Val Ala Met Gly Thr Asp Ile Phe Lys Val Ile
225 230 235 240

Ala Ile Pro Phe Gly Phe Val Ser Asn Leu Thr Asn Ser Trp Ile Gly
245 250 255

Leu Met Ile Ile Tyr Leu Leu Thr Gln Leu Leu Trp Ile Val Gly Ile
260 265 270

His Gly Ala Asn Ile Val Phe Ala Phe Val Ser Pro Ile Ala Leu Ala
275 280 285

Asn Met Ala Glu Asn Ala Ala Gly Gly His Phe Ala Val Ala Gly Glu
290 295 300

Phe Ser Asn Met Phe Val Ile Ala Gly Gly Ser Gly Ala Thr Leu Gly
305 310 315 320

Leu Cys Leu Tyr Ile Ala Phe Ala Ser Lys Ser Glu Gln Leu Lys Ala
325 330 335

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134

Ile Gly Arg Ala Ser Val Val Pro Ala Leu Phe Asn Ile Asn Glu Pro
340 345 350

Leu Ile Phe Gly Leu Pro Ile Ile Tyr Asn Pro Ala Leu Ala Ile Pro
355 360 365

Phe Ile Leu Ala Pro Met Val Thr Ala Thr Ile Tyr Tyr Val Ala Asn
370 375 380

Ser Leu Asn Phe Ile Lys Pro Ile Ile Ala Gln Val Pro Trp Pro Thr
385 390 395 400

Pro Val Gly Ile Gly Ala Phe Leu Gly Thr Ala Asp Leu Arg Ala Val
405 410 415

Leu Val Ala Leu Val Cys Ala Phe Ala Ala Phe Leu Val Tyr Leu Pro
420 425 430

Phe Ile Arg Val Tyr Asp Gln Lys Leu Val Lys Glu Glu Gln Gly Ile
435 440 445

<210> 57

<211> 657

<212> PRT

<213> Streptococcus pneumoniae

<400> 57

Met Lys Lys Phe Tyr Val Ser Pro Ile Phe Pro Ile Leu Val Gly Leu
1 5 10 15

Ile Ala Phe Gly Val Leu Ser Thr Phe Ile Ile Phe Val Asn Asn Asn
20 25 30

Leu Leu Thr Val Leu Ile Leu Phe Leu Phe Val Gly Gly Tyr Val Phe
35 40 45

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135

Leu Phe Lys Lys Leu Arg Val His Tyr Thr Arg Ser Asp Val Glu Gln
50 55 60

Ile Gln Tyr Val Asn His Gln Ala Glu Glu Ser Leu Thr Ala Leu Leu
65 70 75 80

Glu Gln Met Pro Val Gly Val Met Lys Leu Asn Leu Ser Ser Gly Glu
85 90 95

Val Glu Trp Phe Asn Pro Tyr Ala Glu Leu Ile Leu Thr Lys Glu Asp
100 105 110

Gly Asp Phe Asp Leu Glu Ala Val Gln Thr Ile Ile Lys Ala Ser Val
115 120 125

Gly Asn Pro Ser Thr Tyr Ala Lys Leu Gly Glu Lys Arg Tyr Ala Val
130 135 140

His Met Asp Ala Ser Ser Gly Val Leu Tyr Phe Val Asp Val Ser Arg
145 150 155 160

Glu Gln Ala Ile Thr Asp Glu Leu Val Thr Ser Arg Pro Val Ile Gly
165 170 175

Ile Val Ser Val Asp Asn Tyr Asp Asp Leu Glu Asp Glu Thr Ser Glu
180 185 190

Ser Asp Ile Ser Gln Ile Asn Ser Phe Val Ala Asn Phe Ile Ser Glu
195 200 205

Phe Ser Glu Lys His Met Met Phe Ser Arg Arg Val Ser Met Asp Arg
210 215 220

Phe Tyr Leu Phe Thr Asp Tyr Thr Val Leu Glu Gly Leu Met Asn Asp
225 230 235 240

Lys Phe Ser Val Ile Asp Ala Phe Arg Glu Glu Ser Lys Gln Arg Gln
245 250 255

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Phe Pro Asp Asn Ala Val Ile Thr Tyr Ile Glu Ser Gly Ala Ser Ser
450 455 460

137

Ala Ser Glu Leu Val Thr Glu Leu Ile Gln Phe Gln Asn Ser Lys Lys
465 470 475 480

Asn Arg Leu Ser Arg Met Gln Ala Ser Val Leu Met Ala Gly Met Met
485 490 495

Leu Asp Thr Lys Asn Phe Thr Ser Arg Val Thr Ser Arg Thr Phe Asp
500 505 510

Val Ala Ser Tyr Leu Arg Thr Arg Gly Ser Asp Ser Ile Ala Ile Gln
515 520 525

Glu Ile Ala Ala Thr Asp Phe Glu Glu Tyr Arg Glu Val Asn Glu Leu
530 535 540

Ile Leu Gln Gly Arg Lys Leu Gly Ser Asp Val Leu Ile Ala Glu Ala
545 550 555 560

Lys Asp Met Lys Cys Tyr Asp Thr Val Val Ile Ser Lys Ala Ala Asp
565 570 575

Ala Met Leu Ala Met Ser Gly Ile Glu Ala Ser Phe Val Leu Ala Lys
580 585 590

Asn Thr Gln Gly Phe Ile Ser Ile Ser Ala Arg Ser Arg Ser Lys Leu
595 600 605

Asn Val Gln Arg Ile Met Glu Glu Leu Gly Gly Gly Gly His Phe Asn
610 615 620

Leu Ala Ala Ala Gln Ile Lys Asp Val Thr Leu Ser Glu Ala Gly Glu
625 630 635 640

Lys Leu Thr Glu Ile Val Leu Asn Glu Met Lys Glu Lys Glu Lys Glu
645 650 655

Glu

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100270-2828560

[illegible]

Ala Lys Asp Leu Ala Arg Leu Gly Leu Ser Tyr Leu Val Ile Val Gly
85 90 95

140

Ser Asn Ile Leu Gly Ser Ile Leu Leu Gln Leu Ser Asn Glu Thr Thr
100 105 110

Thr Ala Asn Gln Ser Gln Ile Asn Asp Met Val Gln Asn Ser Ser Leu
115 120 125

Ile Ser Ser Phe Phe Leu Leu Ala Leu Leu Ala Pro Ile Cys Glu Glu
130 135 140

Ile Leu Cys Arg Gly Ile Val Pro Lys Lys Ile Phe Arg Gly Lys Glu
145 150 155 160

Asn Leu Gly Phe Val Val Gly Thr Ile Val Phe Ala Leu Leu His Gln
165 170 175

Pro Ser Asn Leu Pro Ser Leu Leu Ile Tyr Gly Gly Met Ser Thr Val
180 185 190

Leu Ser Trp Thr Ala Tyr Lys Thr Gln Arg Leu Glu Met Ser Ile Leu
195 200 205

Leu His Met Ile Val Asn Gly Ile Ala Phe Cys Leu Leu Ala Leu Val
210 215 220

Val Ile Met Ser Arg Thr Leu Gly Ile Ser Val
225 230 235

<210> 60

<211> 533

<212> PRT

<213> Streptococcus pneumoniae

<400> 60

Met Asp Thr Gln Lys Ile Glu Ala Ala Val Lys Met Ile Ile Glu Ala

1

5

10

15

00969787.04960

141

Val Gly Glu Asp Ala Asn Arg Glu Gly Leu Gln Glu Thr Pro Ala Arg
20 25 30

Val Ala Arg Met Tyr Gln Glu Ile Phe Ser Gly Leu Gly Gln Thr Ala
35 40 45

Glu Glu His Leu Ser Lys Ser Phe Glu Ile Ile Asp Asp Asn Met Val
50 55 60

Val Glu Lys Asp Ile Phe Phe His Thr Met Cys Glu His His Phe Leu
65 70 75 80

Pro Phe Tyr Gly Arg Ala His Ile Ala Tyr Ile Pro Asp Gly Arg Val
85 90 95

Ala Gly Leu Ser Lys Leu Ala Arg Thr Val Glu Val Tyr Ser Lys Lys
100 105 110

Pro Gln Ile Gln Glu Arg Leu Asn Ile Glu Val Ala Asp Ala Leu Met
115 120 125

Asp Tyr Leu Gly Ala Lys Gly Ala Phe Val Val Ile Glu Ala Glu His
130 135 140

Met Cys Met Ser Met Arg Gly Val Arg Lys Pro Gly Thr Ala Thr Leu
145 150 155 160

Thr Thr Val Ala Arg Gly Leu Phe Glu Thr Asp Lys Asp Leu Arg Asp
165 170 175

Gln Ala Tyr Arg Leu Met Gly Leu Met Lys Asp Leu Phe Leu Lys Arg
180 185 190

Lys Gln Ala Phe Arg Lys Glu Cys Leu Gly Tyr Leu Arg Tyr Val Leu
195 200 205

Asn Asp His Phe Val Leu Phe Leu Leu Val Leu Leu Gly Phe Leu Ala
210 215 220

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142

Tyr Gln Tyr Ser Gln Leu Leu Gln His Phe Pro Glu Asn His Trp Pro
225 230 235 240

Ile Leu Leu Phe Val Gly Ile Thr Ser Val Leu Leu Leu Leu Trp Gly
245 250 255

Gly Thr Ala Thr Tyr Met Glu Ala Pro Asp Lys Leu Phe Leu Leu Val
260 265 270

Gly Glu Glu Glu Ile Lys Leu His Leu Lys Arg Gln Thr Gly Ile Ser
275 280 285

Leu Val Phe Trp Leu Phe Val Gln Thr Leu Phe Leu Leu Leu Phe Ala
290 295 300

Pro Leu Phe Leu Ala Met Gly Tyr Gly Leu Pro Val Phe Leu Leu Tyr
305 310 315 320

Val Leu Leu Leu Gly Val Gly Lys Tyr Phe His Phe Cys Gln Lys Ala
325 330 335

Ser Lys Phe Phe Thr Glu Thr Gly Leu Asp Trp Asp Tyr Val Ile Ser
340 345 350

Gln Glu Ser Lys Arg Lys Gln Val Leu Leu Arg Phe Phe Ala Leu Phe
355 360 365

Thr Gln Val Lys Gly Ile Ser Asn Ser Val Lys Arg Arg Ala Tyr Leu
370 375 380

Asp Phe Ile Leu Lys Ala Val Gln Lys Val Pro Gly Lys Ile Trp Gln
385 390 395 400

Asn Leu Tyr Leu Arg Ser Tyr Leu Arg Asn Gly Asp Leu Phe Ala Leu
405 410 415

Ser Leu Arg Leu Leu Leu Leu Ser Leu Leu Ala Gln Val Phe Ile Glu
420 425 430

00976979 013501

[illegible]

Phe Tyr Ile Leu Asn Ser Asp Ile Ala Pro Glu Trp Phe Lys Leu Leu
35 40 45

144

Gly Arg Lys Met Glu Val Val Asn Ser Thr Ile Arg Ser Val His Ile
50 55 60

Asp Lys Glu Leu Phe Glu Ser Tyr Lys Thr Gly Pro His Ile Asn Tyr
65 70 75 80

Ala Ser Tyr Phe Arg Phe Phe Ala Thr Glu Val Val Glu Ser Asp Arg
85 90 95

Val Leu Tyr Leu Asp Ser Asp Ile Ile Val Thr Gly Glu Leu Ala Thr
100 105 110

Leu Phe Glu Ile Asp Leu Lys Gly Tyr Ser Ile Gly Ala Val Asp Asp
115 120 125

Val Tyr Ala Tyr Glu Gly Arg Lys Ser Gly Phe Asn Thr Gly Met Leu
130 135 140

Leu Met Asp Val Ala Lys Trp Lys Glu His Ser Ile Val Asn Ser Leu
145 150 155 160

Leu Glu Leu Ala Ala Glu Gln Asn Gln Val Val His Leu Gly Asp Gln
165 170 175

Ser Ile Leu Asn Ile Tyr Phe Glu Asp Asn Trp Leu Ala Leu Asp Lys
180 185 190

Thr Tyr Asn Tyr Met Val Gly Ile Asp Ile Tyr His Leu Ala Gln Glu
195 200 205

Cys Glu Arg Leu Asp Asp Asn Pro Pro Thr Ile Val His Tyr Ala Ser
210 215 220

His Asp Lys Pro Trp Asn Thr Tyr Ser Ile Ser Arg Leu Arg Glu Leu
225 230 235 240

Trp Trp Val Tyr Arg Asp Leu Asp Trp Ser Glu Ile Ala Phe Gln Arg
245 250 255

005670 0450

145

Ser Asp Leu Asn Tyr Phe Glu Arg Ser Asn Gln Ser Lys Lys Gln Val
260 265 270

Met Leu Val Thr Trp Ser Ala Asp Ile Lys His Leu Glu Tyr Leu Val
275 280 285

Gln Arg Leu Pro Asp Trp His Phe His Leu Ala Ala Pro Cys Asp Cys
290 295 300

Ser Glu Glu Leu Thr Ser Leu Ser Gln Tyr Thr Asn Val Thr Val Tyr
305 310 315 320

Gln Asn Val Leu His Ser Arg Ile Asp Trp Leu Leu Asp Asp Ser Ile
325 330 335

Val Tyr Leu Asp Ile Asn Thr Gly Gly Glu Val Phe Asn Val Val Thr
340 345 350

Arg Ala Gln Glu Ser Gly Lys Lys Ile Phe Ala Phe Asp Ile Thr Arg
355 360 365

Lys Ser Met Asp Asp Gly Leu Tyr Asp Gly Ile Phe Ser Val Glu Arg
370 375 380

Pro Asp Asp Leu Val Asp Arg Met Lys Asn Ile Glu Ile Glu
385 390 395

<210> 62

<211> 405

<212> PRT

<213> Streptococcus pneumoniae

<400> 62

Met Thr Lys Ile Tyr Ser Ser Ile Ala Val Lys Lys Gly Leu Phe Thr
1 5 10 15

[illegible]

Leu Met Tyr Arg Ala Arg Tyr Leu Val Pro Val Asn Lys Ile Gly Leu
210 215 220

[illegible]

Ala Gly Gly Met Pro Tyr Met Tyr Val Met Ser Phe Leu Ser Val Pro
245 250 255

Ala Tyr Leu Phe Ile Leu Leu Gly Phe Ile Phe Pro Asn His Ser Gly
260 265 270

Leu Ala Ala Leu Ser Lys Glu Phe Met Val Gly Lys Pro Leu Trp Val
275 280 285

Tyr Val Tyr Ile Ser Val Leu Phe Leu Phe Ser Ile Ile Phe Ala Phe
290 295 300

Val Thr Met Asn Gly Glu Glu Ile Ala Asp Arg Met Lys Lys Ser Gly
305 310 315 320

Glu Tyr Ile Tyr Gly Ile Tyr Pro Gly Ala Asp Thr Ser Arg Phe Ile
325 330 335

Asn Arg Leu Val Leu Arg Phe Ser Val Ile Gly Gly Leu Phe Asn Val
340 345 350

Ile Met Ala Gly Gly Pro Met Leu Phe Val Leu Phe Asp Glu Lys Leu
355 360 365

Leu Arg Leu Ala Met Ile Pro Gly Leu Phe Met Met Phe Gly Gly Met
370 375 380

Ile Phe Thr Ile Arg Asp Glu Val Lys Ala Leu Arg Leu Asn Glu Thr
385 390 395 400

Tyr Arg Pro Leu Ile
405

<210> 63

<211> 763

<212> PRT

<213> Streptococcus pneumoniae

<400> 63

Met Ser Ser Leu Ser Asp Gln Glu Leu Val Ala Lys Thr Val Glu Phe

1

5

10

15

Arg Gln Arg Leu Ser Glu Gly Glu Ser Leu Asp Asp Ile Leu Val Glu

20

25

30

Ala Phe Ala Val Val Arg Glu Ala Asp Lys Arg Ile Leu Gly Met Phe

35

40

45

Pro Tyr Asp Val Gln Val Met Gly Ala Ile Val Met His Tyr Gly Asn

50

55

60

Val Ala Glu Met Asn Thr Gly Glu Gly Lys Thr Leu Thr Ala Thr Met

65

70

75

80

Pro Val Tyr Leu Asn Ala Phe Ser Gly Glu Gly Val Met Val Val Thr

85

90

95

Pro Asn Glu Tyr Leu Ser Lys Arg Asp Ala Glu Glu Met Gly Gln Val

100

105

110

Tyr Arg Phe Leu Gly Leu Thr Ile Gly Val Pro Phe Thr Glu Asp Pro

115

120

125

Lys Lys Glu Met Lys Ala Glu Glu Lys Lys Leu Ile Tyr Ala Ser Asp

130

135

140

Ile Ile Tyr Thr Thr Asn Ser Asn Leu Gly Phe Asp Tyr Leu Asn Asp

145

150

155

160

Asn Leu Ala Ser Asn Glu Glu Gly Lys Phe Leu Arg Pro Phe Asn Tyr

165

170

175

00769787 012601

Val	Ile	Ile	Asp	Glu	Ile	Asp	Asp	Ile	Leu	Leu	Asp	Ser	Ala	Gln	Thr				
				180					185									190	
Pro	Leu	Ile	Ile	Ala	Gly	Ser	Pro	Arg	Val	Gln	Ser	Asn	Tyr	Tyr	Ala				
				195					200					205					
Ile	Ile	Asp	Thr	Leu	Val	Thr	Thr	Leu	Val	Glu	Gly	Glu	Asp	Tyr	Ile				
				210				215					220						
Phe	Lys	Glu	Glu	Lys	Glu	Glu	Val	Trp	Leu	Thr	Thr	Lys	Gly	Ala	Lys				
225						230					235							240	
Ser	Ala	Glu	Asn	Phe	Leu	Gly	Ile	Asp	Asn	Leu	Tyr	Lys	Glu	Glu	His				
				245						250					255				
Ala	Ser	Phe	Ala	Arg	His	Leu	Val	Tyr	Ala	Ile	Arg	Ala	His	Lys	Leu				
				260					265					270					
Phe	Thr	Lys	Asp	Lys	Asp	Tyr	Ile	Ile	Arg	Gly	Asn	Glu	Met	Val	Leu				
				275					280					285					
Val	Asp	Lys	Gly	Thr	Gly	Arg	Leu	Met	Glu	Met	Thr	Lys	Leu	Gln	Gly				
				290				295						300					
Gly	Leu	His	Gln	Ala	Ile	Glu	Ala	Lys	Glu	His	Val	Lys	Leu	Ser	Pro				
305						310						315			320				
Glu	Thr	Arg	Ala	Met	Ala	Ser	Ile	Thr	Tyr	Gln	Ser	Leu	Phe	Lys	Met				
				325						330					335				
Phe	Asn	Lys	Ile	Ser	Gly	Met	Thr	Gly	Thr	Gly	Lys	Val	Ala	Glu	Lys				
				340						345					350				
Glu	Phe	Ile	Glu	Thr	Tyr	Asn	Met	Ser	Val	Val	Arg	Ile	Pro	Thr	Asn				
				355					360					365					
Arg	Pro	Arg	Gln	Arg	Ile	Asp	Tyr	Pro	Asp	Asn	Leu	Tyr	Ile	Thr	Leu				
				370						375					380				

150

Pro Glu Lys Val Tyr Ala Ser Leu Glu Tyr Ile Lys Gln Tyr His Ala
385 390 395 400

Lys Gly Asn Pro Leu Leu Val Phe Val Gly Ser Val Glu Met Ser Gln
405 410 415

Leu Tyr Ser Ser Leu Leu Phe Arg Glu Gly Ile Ala His Asn Val Leu
420 425 430

Asn Ala Asn Asn Ala Ala Arg Glu Ala Gln Ile Ile Ser Glu Ser Gly
435 440 445

Gln Met Gly Ala Val Thr Val Ala Thr Ser Met Ala Gly Arg Gly Thr
450 455 460

Asp Ile Lys Leu Gly Lys Gly Val Ala Glu Leu Gly Gly Leu Ile Val
465 470 475 480

Ile Gly Thr Glu Arg Met Glu Ser Gln Arg Ile Asp Leu Gln Ile Arg
485 490 495

Gly Arg Ser Gly Arg Gln Gly Asp Pro Gly Met Ser Lys Phe Phe Val
500 505 510

Ser Leu Glu Asp Asp Val Ile Lys Lys Phe Gly Pro Ser Trp Val His
515 520 525

Lys Lys Tyr Lys Asp Tyr Gln Val Gln Asp Met Thr Gln Pro Glu Val
530 535 540

Leu Lys Gly Arg Lys Tyr Arg Lys Leu Val Glu Lys Ala Glh His Ala
545 550 555 560

Ser Asp Ser Ala Gly Arg Ser Ala Arg Arg Gln Thr Leu Glu Tyr Ala
565 570 575

Glu Ser Met Asn Ile Gln Arg Asp Ile Val Tyr Lys Glu Arg Asn Arg
580 585 590

009693 01360

Leu Ile Asp Gly Ser Arg Asp Leu Glu Asp Val Val Val Asp Ile Ile
 595 600 605

Glu Arg Tyr Thr Glu Glu Val Ala Ala Asp His Tyr Ala Ser Arg Glu
 610 615 620

Leu Leu Phe His Phe Ile Val Thr Asn Ile Ser Phe His Val Lys Glu
 625 630 635 640

Val Pro Asp Tyr Ile Asp Val Thr Asp Lys Thr Ala Val Arg Ser Phe
 645 650 655

Met Lys Gln Val Ile Asp Lys Glu Leu Ser Glu Lys Lys Glu Leu Leu
 660 665 670

Asn Gln His Asp Leu Tyr Glu Gln Phe Leu Arg Leu Ser Leu Leu Lys
 675 680 685

Ala Ile Asp Asp Asn Trp Val Glu Gln Val Asp Tyr Leu Gln Gln Leu
 690 695 700

Ser Met Ala Ile Gly Gly Gln Ser Ala Ser Gln Lys Asn Pro Ile Val
 705 710 715 720

Glu Tyr Tyr Gln Glu Ala Tyr Ala Gly Phe Glu Ala Met Lys Glu Gln
 725 730 735

Ile His Ala Asp Met Val Arg Asn Leu Leu Met Gly Leu Val Glu Val
 740 745 750

Thr Pro Lys Gly Glu Ile Val Thr His Phe Pro
 755 760

103210 2626260

<210> 64

<211> 319

<212> PRT

<213> Streptococcus pneumoniae

<400> 64

Met Ile Gly Thr Phe Ala Ala Ala Leu Val Ala Val Leu Ala Asn Phe

1 5 10 15

Ile Val Pro Ile Glu Ile Thr Pro Asn Ser Ala Asn Thr Glu Ile Ala

20 25 30

Pro Pro Asp Gly Ile Gly Gln Val Leu Ser Asn Leu Leu Leu Lys Leu

35 40 45

Val Asp Asn Pro Val Asn Ala Leu Leu Thr Ala Asn Tyr Ile Arg Ile

50 55 60

Leu Ser Trp Ala Val Ile Phe Gly Ile Ala Met Arg Glu Ala Ser Lys

65 70 75 80

Asn Ser Gln Glu Leu Leu Lys Thr Ile Ala Asp Val Thr Ser Lys Ile

85 90 95

Val Glu Trp Ile Ile Asn Leu Ala Pro Phe Gly Ile Leu Gly Leu Val

100 105 110

Phe Lys Thr Ile Ser Asp Lys Gly Val Gly Ser Leu Ala Asn Tyr Gly

115 120 125

Ile Leu Leu Val Leu Leu Val Thr Thr Met Leu Phe Val Ala Pro Val

130 135 140

Val Asn Pro Leu Ile Ala Phe Phe Phe Met Arg Arg Asn Pro Tyr Pro

145 150 155 160

Leu Val Trp Asn Cys Leu Arg Val Ser Gly Val Thr Ala Phe Phe Thr

165 170 175

009769769 0045604

153

Arg Ser Ser Ala Thr Asn Ile Pro Val Asn Met Lys Leu Cys His Asp
180 185 190

Leu Gly Leu Asn Pro Asp Thr Tyr Ser Val Ser Ile Pro Leu Gly Ser
195 200 205

Thr Ile Asn Met Ala Gly Val Ala Ile Thr Ile Asn Leu Leu Thr Leu
210 215 220

Ala Ala Val Asn Thr Leu Gly Ile Pro Val Asp Phe Ala Thr Ala Phe
225 230 235 240

Val Leu Ser Val Val Ala Ala Ile Ser Ser Cys Asp Ala Ser Gly Ile
245 250 255

Ala Gly Gly Ser Leu Leu Leu Ile Pro Val Ala Cys Ser Leu Phe Gly
260 265 270

Ile Ser Asn Asp Ile Ala Ile Gln Ile Val Gly Val Gly Phe Val Ile
275 280 285

Gly Val Ile Gln Asp Ser Cys Glu Thr Ala Leu Asn Ser Ser Thr Asp
290 295 300

Val Leu Phe Thr Ala Val Ala Glu Tyr Ala Ala Thr Arg Lys Lys
305 310 315

<210> 65

<211> 317

<212> PRT

<213> Streptococcus pneumoniae

<400> 65

Met Ser Ile Ser Gln Arg Thr Thr Lys Leu Ile Leu Ala Thr Cys Leu
1 5 10 15

[illegible]

Gly Ile Ile Ala Leu Leu Ser Leu Ser Asp Thr Arg Arg Ser Thr Leu
35 40 45

Gly Val Leu Ala Phe His Leu Ser Gly Phe His Ile Trp Ser Leu Gly
65 70 75 80

Ile Gly Ile Thr Pro Ser Thr Val Leu Val Ser His Leu Leu Val Gln
100 105 110

Ile Gly Thr Gly Phe Ala Leu Leu Val Asn Leu Tyr Met Pro Ser Arg
130 135 140

Asp Ile Leu Gln Arg Phe Lys Tyr Tyr Leu Ser Arg Gly Asp Gly Arg
165 170 175

Leu Arg Leu Val Tyr Leu Asp His Ser Asp His Leu Phe His Gln Thr
195 200 205

Asp Tyr His Ile His Tyr Phe Glu Met Arg Gln Arg Gln Ser Arg Ile
210 215 220

155

Leu Arg Asn Met Ala Gln Gln Ile Asn Thr Cys His Leu Ala Ala Ser
225 230 235 240

Glu Ser Leu Ile Leu Ala Gln Leu Phe Ser Lys Ile Ala Gly Gln Leu
245 250 255

Ser Gln Thr Asn Pro Ala Ser Asp Leu Leu Asp Glu Ile Glu Arg Tyr
260 265 270

Leu Glu Val Phe Arg Asn Arg Ser Leu Pro Lys Thr Arg Glu Glu Phe
275 280 285

Glu Thr Arg Ala Thr Leu Leu Gln Leu Leu Arg Glu Ala Lys Thr Phe
290 295 300

Ile Gln Val Lys Val Asp Phe Tyr Gln Lys Tyr Arg Gln
305 310 315

<210> 66

<211> 537

<212> PRT

<213> Streptococcus pneumoniae

<400> 66

Met Glu Ile Met Ser Leu Ala Ile Ala Val Phe Ala Val Ile Ile Gly
1 5 10 15

Leu Val Ile Gly Tyr Val Ser Ile Ser Ala Lys Met Lys Ser Ser Gln
20 25 30

Glu Ala Ala Glu Leu Met Leu Leu Asn Ala Glu Gln Glu Ala Thr Asn
35 40 45

Leu Arg Gly Gln Ala Glu Arg Glu Ala Asp Leu Leu Val Asn Glu Ala
50 55 60

009210 2369260

156

Lys Arg Glu Ser Lys Ser Leu Lys Lys Glu Ala Leu Leu Glu Ala Lys
65 70 75 80

Glu Glu Ala Arg Lys Tyr Arg Glu Glu Val Asp Ala Glu Phe Lys Ser
85 90 95

Glu Arg Gln Glu Leu Lys Gln Ile Glu Ser Arg Leu Thr Glu Arg Ala
100 105 110

Thr Ser Leu Asp Arg Lys Asp Asp Asn Leu Thr Ser Lys Glu Gln Thr
115 120 125

Leu Glu Gln Lys Glu Gln Ser Ile Ser Asp Arg Ala Lys Asn Leu Asp
130 135 140

Ala Arg Glu Glu Gln Leu Glu Glu Val Glu Arg Gln Lys Glu Ala Glu
145 150 155 160

Leu Glu Arg Ile Gly Ala Leu Ser Gln Ala Glu Ala Arg Asp Ile Ile
165 170 175

Leu Ala Gln Thr Glu Glu Asn Leu Thr Arg Glu Ile Ala Ser Arg Ile
180 185 190

Arg Glu Ala Glu Gln Glu Val Lys Glu Arg Ser Asp Lys Met Ala Lys
195 200 205

Asp Ile Leu Val Gln Ala Met Gln Arg Ile Ala Gly Glu Tyr Val Ala
210 215 220

Glu Ser Thr Asn Ser Thr Val His Leu Pro Asp Asp Thr Met Lys Gly
225 230 235 240

Arg Ile Ile Gly Arg Glu Gly Arg Asn Ile Arg Thr Phe Glu Ser Leu
245 250 255

Thr Gly Val Asp Val Ile Ile Asp Asp Thr Pro Glu Val Val Thr Leu
260 265 270

00769797 013504

Leu Glu Glu Ile Ala Asn Gly Phe Glu Gly Val Gln Thr Ser Phe Ala
465 470 475 480

158

Leu Gln Ala Gly Arg Glu Ile Arg Ile Met Val Asn Pro Gly Lys Ile
485 490 495

Lys Asp Asp Lys Val Thr Ile Leu Ala His Lys Val Arg Lys Lys Ile
500 505 510

Glu Asn Asn Leu Asp Tyr Pro Gly Asn Ile Lys Val Thr Val Ile Arg
515 520 525

Glu Leu Arg Ala Val Asp Tyr Ala Lys
530 535

<210> 67

<211> 104

<212> PRT

<213> Streptococcus pneumoniae

<400> 67

Met Met Leu Lys Pro Ser Ile Asp Thr Leu Leu Asp Lys Val Pro Ser
1 5 10 15

Lys Tyr Ser Leu Val Ile Leu Glu Ala Lys Arg Ala His Glu Leu Glu
20 25 30

Ala Gly Ala Pro Ala Thr Gln Gly Phe Lys Ser Glu Lys Ser Thr Leu
35 40 45

Arg Ala Leu Glu Glu Ile Glu Ser Gly Asn Val Thr Ile His Pro Asp
50 55 60

Pro Glu Gly Lys Arg Glu Ala Val Arg Arg Arg Ile Glu Glu Glu Lys
65 70 75 80

Arg Arg Lys Glu Glu Glu Glu Lys Lys Ile Lys Glu Gln Ile Ala Lys
85 90 95

09769797 043601

Glu Lys Glu Asp Gly Glu Lys Ile

100

<210> 68

<211> 263

<212> PRT

<213> Streptococcus pneumoniae

<400> 68

Met Ser Ala Tyr Gln Leu Pro Thr Val Trp Gln Asp Glu Ala Ser Asn

1

5

10

15

Gln Gly Ala Phe Thr Gly Leu Asn Arg Pro Thr Ala Gly Ala Arg Phe

20

25

30

Glu Gln Asn Leu Pro Lys Gly Glu Gln Ala Phe Gln Leu Tyr Ser Leu

35

40

45

Gly Thr Pro Asn Gly Val Lys Val Thr Ile Leu Leu Glu Glu Leu Leu

50

55

60

Glu Ala Gly Phe Lys Glu Ala Ala Tyr Asp Leu Tyr Lys Ile Ala Ile

65

70

75

80

Met Asp Gly Asp Gln Phe Gly Ser Asp Phe Val Lys Leu Asn Pro Asn

85

90

95

Ser Lys Ile Pro Ala Leu Leu Asp Gln Ser Gly Thr Glu Asn Val Arg

100

105

110

Val Phe Glu Ser Ala His Ile Leu Leu Tyr Leu Ala Glu Lys Phe Gly

115

120

125

Ala Phe Leu Pro Ser Asn Pro Val Glu Lys Val Glu Val Leu Asn Trp

130

135

140

003699 0930 1846560

160

Leu Phe Trp Gln Ala Gly Ala Ala Pro Phe Leu Gly Gly Gly Phe Gly
145 150 155 160

His Phe Phe Asn Tyr Ala Pro Glu Lys Leu Glu Tyr Pro Ile Asn Arg
165 170 175

Phe Thr Met Glu Val Lys Arg Gln Leu Asp Leu Leu Asp Lys Glu Leu
180 185 190

Ala Gln Lys Pro Tyr Ile Ala Gly Asn Asp Tyr Thr Ile Ala Asp Ile
195 200 205

Ala Ile Trp Ser Trp Tyr Gly Gln Leu Val Gln Gly Asn Leu Tyr Gln
210 215 220

Gly Ser Ala Lys Phe Leu Asp Ala Ser Ser Tyr Gln Asn Leu Val Lys
225 230 235 240

Trp Ala Glu Lys Ile Ala Asn Arg Pro Ala Val Lys Arg Gly Leu Glu
245 250 255

Val Thr Tyr Thr Glu Ile Lys
260

<210> 69

<211> 312

<212> PRT

<213> Streptococcus pneumoniae

<400> 69

Leu Ala Ser Leu Ile Thr Ser Ile Ile Met Phe Tyr Val Gly Phe Asp
1 5 10 15

Val Leu Arg Asp Thr Ile Gln Lys Ile Leu Ser Arg Glu Glu Thr Val
20 25 30

0976979 01564

161

Ile Asp Pro Leu Gly Ala Thr Leu Gly Ile Ile Ser Ala Ala Ile Met
35 40 45

Phe Val Val Tyr Leu Tyr Asn Thr Arg Leu Ser Lys Lys Ser Asn Ser
50 55 60

Asn Ala Leu Lys Ala Ala Ala Lys Asp Asn Leu Ser Asp Ala Val Thr
65 70 75 80

Ser Leu Gly Thr Ala Ile Ala Ile Leu Ala Ser Ser Phe Asn Tyr Pro
85 90 95

Ile Val Asp Lys Leu Val Ala Ile Ile Ile Thr Phe Phe Ile Leu Lys
100 105 110

Thr Ala Tyr Asp Ile Phe Ile Glu Ser Ser Phe Ser Leu Ser Asp Gly
115 120 125

Phe Asp Asp Arg Leu Leu Glu Asp Tyr Gln Lys Ala Ile Met Glu Ile
130 135 140

Pro Lys Ile Ser Lys Val Lys Ser Gln Arg Gly Arg Thr Tyr Gly Ser
145 150 155 160

Asn Ile Tyr Leu Asp Ile Thr Leu Glu Met Asn Pro Asp Leu Ser Val
165 170 175

Phe Glu Ser His Glu Ile Ala Asp Gln Val Glu Ser Met Leu Glu Glu
180 185 190

Arg Phe Gly Val Phe Asp Thr Asp Val His Ile Glu Pro Ala Pro Ile
195 200 205

Pro Glu Asp Glu Ile Leu Asp Asn Val Tyr Lys Lys Leu Leu Met Arg
210 215 220

Glu Gln Leu Ile Asp Gln Gly Asn Gln Leu Glu Glu Leu Leu Thr Asp
225 230 235 240

00969797 013601

[illegible]

Ile Ala Glu Asn Gly Ser Leu Val Glu Tyr Gln Gly Gln Asp Leu Tyr
65 70 75 80

163

Glu Ala Thr Met Ser Arg Asp Phe Tyr Leu Ala Thr Phe Glu Lys Leu
85 90 95

Lys Thr Ser Pro Tyr Val Asp Ile Asn Lys Leu Leu Leu Thr Gly Lys
100 105 110

Lys Gly Ser Tyr Val Leu Asp Thr Val Asp Glu Thr Tyr Leu Lys Val
115 120 125

Ser Gln His Tyr Asn Glu Asn Ile Gln Lys Val Ala Ser Leu Glu Asp
130 135 140

Ile Thr Asp Asp Ile Phe Lys Phe Thr Thr Asn Phe Thr Glu Glu Thr
145 150 155 160

Leu Glu Asp Gly Glu Ala Trp Val Asn Glu Asn Val Pro Gly Val Lys
165 170 175

Ala Met Thr Thr Gly Phe Glu Ser Ile Asp Ile Val Leu Asp Tyr Val
180 185 190

Asp Lys Gly Val Ala Ile Val Glu Leu Val Lys Lys Leu Gly Ile Thr
195 200 205

Met Asp Gln Val Met Ala Phe Gly Asp Asn Leu Asn Asp Leu His Met
210 215 220

Met Gln Val Val Gly His Pro Val Ala Pro Glu Asn Ala Arg Pro Glu
225 230 235 240

Ile Leu Glu Leu Ala Lys Thr Val Ile Gly His His Lys Glu Arg Ser
245 250 255

Val Ile Ala Tyr Met Glu Gly Leu
260

00769707 045504

<213> Streptococcus pneumoniae

Pro Leu Asp Ala Ala Ile Gln Lys Ile Ser Pro Glu Leu Phe Asp Gln
165 170 175

[illegible]

Ser Leu Glu Asp Gln Ala Asp His Leu Ser Asp Gln Leu Asp Tyr Arg
35 40 45

166

Phe Asp Gln Ala Arg Gln Ala Ser Gln Leu Asp Gln Lys Asp Leu Glu
50 55 60

Val Val Val Ser Asp Arg Leu Gln Glu Val Arg Ile Glu Leu His Gln
65 70 75 80

Gly Leu Thr Gln Val Arg Gln Glu Met Thr Asp Asn Leu Leu Gln Thr
85 90 95

Arg Asp Lys Thr Asp Gln Arg Leu Gln Ala Leu Gln Glu Ser Asn Glu
100 105 110

Gln Arg Leu Glu Gln Met Arg Gln Thr Val Glu Glu Lys Leu Glu Lys
115 120 125

Thr Leu Gln Thr Arg Leu Gln Ala Ser Phe Glu Thr Val Ser Lys Gln
130 135 140

Leu Glu Ser Val Asn Arg Gly Leu Gly Glu Met Gln Thr Val Ala Arg
145 150 155 160

Asp Val Gly Ala Leu Asn Lys Val Leu Ser Gly Thr Lys Thr Arg Gly
165 170 175

Ile Leu Gly Glu Leu Gln Leu Gly Gln Ile Ile Glu Asp Ile Met Thr
180 185 190

Pro Ala Gln Tyr Glu Arg Glu Tyr Ala Thr Val Glu Asn Ser Ser Glu
195 200 205

Arg Val Glu Tyr Ala Ile Lys Leu Pro Gly Gln Gly Asp Gln Glu Tyr
210 215 220

Val Tyr Leu Pro Ile Asp Ser Lys Phe Pro Leu Ala Asp Tyr Tyr Arg
225 230 235 240

Leu Glu Glu Ala Tyr Glu Thr Gly Asp Lys Asp Glu Ile Glu Arg Cys
245 250 255

005639 01304

[illegible]

Arg Lys Ser Leu Leu Ala Ser Val Lys Arg Phe Ala Arg Asp Ile Arg
260 265 270

Asn Lys Tyr Ile Ala Pro Pro Arg Thr Thr Asn Phe Gly Val Leu Phe
275 280 285

Val Pro Thr Glu Gly Leu Tyr Ser Glu Ile Val Arg Asn Pro Val Phe
290 295 300

Phe Asp Asp Leu Arg Arg Glu Glu Gln Ile Ile Val Ala Gly Pro Ser
305 310 315 320

Thr Leu Ser Ala Leu Leu Asn Ser Leu Ser Val Gly Phe Lys Thr Leu
325 330 335

Asn Ile Gln Lys Ser Ala Asp His Ile Ser Lys Thr Leu Ala Ser Val
340 345 350

Lys Thr Glu Phe Gly Lys Phe Gly Gly Ile Leu Val Lys Ala Gln Lys
355 360 365

His Leu Gln His Ala Ser Gly Asn Ile Asp Glu Leu Leu Asn Arg Arg
370 375 380

Thr Ile Ala Ile Glu Arg Thr Leu Arg His Ile Glu Leu Ser Glu Gly
385 390 395 400

Glu Pro Ala Leu Asp Leu Leu His Phe Gln Glu Asn Glu Glu Glu Tyr
405 410 415

Glu Asp

<210> 73

<211> 313

<212> PRT

<213> Streptococcus pneumoniae

<400> 73

Met Lys Ile Ser His Met Lys Lys Asp Glu Leu Phe Glu Gly Phe Tyr

1 5 10 15

Leu Ile Lys Ser Ala Asp Leu Arg Gln Thr Arg Ala Gly Lys Asn Tyr

20 25 30

Leu Ala Phe Thr Phe Gln Asp Asp Ser Gly Glu Ile Asp Gly Lys Leu

35 40 45

Trp Asp Ala Gln Pro His Asn Ile Glu Ala Phe Thr Ala Gly Lys Val

50 55 60

Val His Met Lys Gly Arg Arg Glu Val Tyr Asn Asn Thr Pro Gln Val

65 70 75 80

Asn Gln Ile Thr Leu Arg Leu Pro Gln Ala Gly Glu Pro Asn Asp Pro

85 90 95

Ala Asp Phe Lys Val Lys Ser Pro Val Asp Val Lys Glu Ile Arg Asp

100 105 110

Tyr Met Ser Gln Met Ile Phe Lys Ile Glu Asn Pro Val Trp Gln Arg

115 120 125

Ile Val Arg Asn Leu Tyr Thr Lys Tyr Asp Lys Glu Phe Tyr Ser Tyr

130 135 140

Pro Ala Ala Lys Thr Asn His His Ala Phe Glu Thr Gly Leu Ala Tyr

145 150 155 160

His Thr Ala Thr Met Val Arg Leu Ala Asp Ala Ile Ser Glu Val Tyr

165 170 175

00369797 013601

169

Pro Gln Leu Asn Lys Ser Leu Leu Tyr Ala Gly Ile Met Leu His Asp
180 185 190

Leu Ala Lys Val Ile Glu Leu Thr Gly Pro Asp Gln Thr Glu Tyr Thr
195 200 205

Val Arg Gly Asn Leu Leu Gly His Ile Ala Leu Ile Asp Ser Glu Ile
210 215 220

Thr Lys Thr Val Met Glu Leu Gly Ile Asp Asp Thr Lys Glu Glu Val
225 230 235 240

Val Leu Leu Arg His Val Ile Leu Ser His His Gly Leu Leu Glu Tyr
245 250 255

Gly Ser Pro Val Arg Pro Arg Ile Met Glu Ala Glu Ile Ile His Met
260 265 270

Ile Asp Asn Leu Asp Ala Ser Met Met Met Met Ser Thr Ala Leu Ala
275 280 285

Leu Val Asp Lys Gly Glu Met Thr Asn Lys Ile Phe Ala Met Asp Asn
290 295 300

Arg Ser Phe Tyr Lys Pro Asp Leu Asp
305 310

<210> 74

<211> 503

<212> PRT

<213> Streptococcus pneumoniae

<400> 74

Met Ser Glu Lys Ala Lys Lys Gly Phe Lys Met Pro Ser Ser Tyr Thr
1 5 10 15

009693 01504
105510 1526260

[illegible]

Pro Ala Gly Ala Phe Ile Glu Gly Ile Tyr Glu Thr Gln Pro Gln Asn
35 40 45

Pro Gln Gly Ile Trp Asp Val Leu Met Ala Pro Ile Arg Ala Met Leu
50 55 60

Gly Thr His Pro Glu Glu Gly Ser Leu Ile Lys Glu Thr Ser Ala Ala
65 70 75 80

Ile Asp Val Ala Phe Phe Ile Leu Met Val Gly Gly Phe Leu Gly Ile
85 90 95

Val Asn Lys Thr Gly Ala Leu Asp Val Gly Ile Ala Ser Ile Val Lys
100 105 110

Lys Tyr Lys Gly Arg Glu Lys Met Leu Ile Leu Val Leu Met Pro Leu
115 120 125

Phe Ala Leu Gly Gly Thr Thr Tyr Gly Met Gly Glu Glu Thr Met Ala
130 135 140

Phe Tyr Pro Leu Leu Val Pro Val Met Met Ala Val Gly Phe Asp Ser
145 150 155 160

Leu Thr Gly Val Ala Ile Ile Leu Leu Gly Ser Gln Ile Gly Cys Leu
165 170 175

Ala Ser Thr Leu Asn Pro Phe Ala Thr Gly Ile Ala Ser Ala Thr Ala
180 185 190

Gly Val Gly Thr Gly Asp Gly Ile Val Leu Arg Leu Ile Phe Trp Val
195 200 205

Thr Leu Thr Ala Leu Ser Thr Trp Phe Val Tyr Arg Tyr Ala Asp Lys
210 215 220

171

Ile Gln Lys Asp Pro Thr Lys Ser Leu Val Tyr Ser Thr Arg Lys Glu
225 230 235 240

Asp Leu Lys His Phe Asn Val Glu Glu Ser Ser Ser Val Glu Ser Thr
245 250 255

Leu Ser Ser Lys Gln Lys Ser Val Leu Phe Leu Phe Val Leu Thr Phe
260 265 270

Ile Leu Met Val Leu Ser Phe Ile Pro Trp Thr Asp Leu Gly Val Thr
275 280 285

Ile Phe Asp Asp Phe Asn Thr Trp Leu Thr Gly Leu Pro Val Ile Gly
290 295 300

Asn Ile Val Gly Ser Ser Thr Ser Ala Leu Gly Thr Trp Tyr Phe Pro
305 310 315 320

Glu Gly Ala Met Leu Phe Ala Phe Met Gly Ile Leu Ile Gly Val Ile
325 330 335

Tyr Gly Leu Lys Glu Asp Lys Ile Ile Ser Ser Phe Met Asn Gly Ala
340 345 350

Ala Asp Leu Leu Ser Val Ala Leu Ile Val Ala Ile Ala Arg Gly Ile
355 360 365

Gln Val Ile Met Asn Asp Gly Met Ile Thr Asp Thr Ile Leu Asn Trp
370 375 380

Gly Lys Glu Gly Leu Ser Gly Leu Ser Ser Gln Val Phe Ile Val Val
385 390 395 400

Thr Tyr Ile Phe Tyr Leu Pro Met Ser Phe Leu Ile Pro Ser Ser Ser
405 410 415

Gly Leu Ala Ser Ala Thr Met Gly Ile Met Ala Pro Leu Gly Glu Phe
420 425 430

00769787 04504

172

Val Asn Val Arg Pro Ser Leu Ile Ile Thr Ala Tyr Gln Ser Ala Ser
435 440 445

Gly Val Leu Asn Leu Ile Ala Pro Thr Ser Gly Ile Val Met Gly Ala
450 455 460

Leu Ala Leu Gly Arg Ile Asn Ile Gly Thr Trp Trp Lys Phe Met Gly
465 470 475 480

Lys Leu Val Val Ala Ile Ile Val Val Thr Ile Ala Leu Leu Leu Leu
485 490 495

Gly Thr Phe Leu Pro Phe Leu
500

<210> 75

<211> 782

<212> PRT

<213> Streptococcus pneumoniae

<400> 75

Met Ser Asn Ser Phe Val Lys Leu Leu Val Ser Gln Leu Phe Ala Asn
1 5 10 15

Leu Ala Asp Ile Phe Phe Arg Val Thr Ile Ile Ala Asn Ile Tyr Ile
20 25 30

Ile Ser Lys Ser Val Ile Ala Thr Ser Leu Val Pro Ile Leu Ile Gly
35 40 45

Ile Ser Ser Phe Val Ala Ser Leu Leu Val Pro Leu Val Thr Lys Arg
50 55 60

Leu Ala Leu Asn Arg Val Leu Ser Leu Ser Gln Phe Gly Lys Thr Ile
65 70 75 80

0096970 28269260

Phe Leu Ala Ala Lys Trp Glu Pro Gln Leu Phe Thr Pro Asn Leu Lys
275 280 285

174

Thr Ile Gln Asn Pro Cys Leu Ser Leu Asp Pro Gly Trp Phe Leu Phe
290 295 300

Ser Pro Asn Gly Cys Phe Leu Leu Asp Lys Lys Glu Phe Pro Leu Tyr
305 310 315 320

Gly Ile Ser Val Glu Lys Asn Thr Lys Arg Lys Glu Thr His Met Asn
325 330 335

Ser Leu Pro Asn His His Phe Gln Asn Lys Ser Phe Tyr Gln Leu Ser
340 345 350

Phe Asp Gly Gly His Leu Thr Gln Tyr Gly Gly Leu Ile Phe Phe Gln
355 360 365

Glu Leu Phe Ser Gln Leu Lys Leu Lys Glu Arg Ile Ser Lys Tyr Leu
370 375 380

Val Thr Asn Asp Gln Arg Arg Tyr Cys Arg Tyr Ser Asp Ser Asp Ile
385 390 395 400

Leu Val Gln Phe Leu Phe Gln Leu Leu Thr Gly Tyr Gly Thr Asp Tyr
405 410 415

Ala Cys Lys Glu Leu Ser Ala Asp Ala Tyr Phe Pro Lys Leu Leu Glu
420 425 430

Gly Gly Gln Leu Ala Ser Gln Pro Thr Leu Ser Arg Phe Leu Ser Arg
435 440 445

Thr Asp Glu Glu Thr Val His Ser Leu Arg Cys Leu Asn Leu Glu Leu
450 455 460

Val Glu Phe Phe Leu Gln Phe His Gln Leu Asn Gln Leu Ile Val Asp
465 470 475 480

Ile Asp Ser Thr His Phe Thr Thr Tyr Gly Lys Gln Glu Gly Val Ala
485 490 495

095979 01501
T095979 01501

175

Tyr Asn Ala His Tyr Arg Ala His Gly Tyr His Pro Leu Tyr Ala Phe
500 505 510

Glu Gly Lys Thr Gly Tyr Cys Phe Asn Ala Gln Leu Arg Pro Gly Asn
515 520 525

Arg Tyr Cys Ser Glu Glu Ala Asp Ser Phe Ile Thr Pro Val Leu Glu
530 535 540

Arg Phe Asn Gln Leu Leu Phe Arg Met Asp Ser Gly Phe Ala Thr Pro
545 550 555 560

Lys Leu Tyr Asp Leu Ile Glu Lys Thr Gly Gln Tyr Tyr Leu Ile Lys
565 570 575

Leu Lys Lys Asn Thr Val Leu Ser Arg Leu Gly Asp Leu Ser Leu Pro
580 585 590

Cys Pro Gln Asp Glu Asp Leu Thr Ile Leu Pro His Ser Ala Tyr Ser
595 600 605

Glu Thr Leu Tyr Gln Ala Gly Ser Trp Ser His Lys Arg Arg Val Cys
610 615 620

Gln Phe Ser Glu Arg Lys Glu Gly Asn Leu Phe Tyr Asp Val Ile Ser
625 630 635 640

Leu Val Thr Asn Met Thr Ser Gly Thr Ser Gln Asp Gln Phe Gln Leu
645 650 655

Tyr Arg Gly Arg Gly Gln Ala Glu Asn Phe Ile Lys Glu Met Lys Glu
660 665 670

Gly Phe Phe Gly Asp Lys Thr Asp Ser Ser Thr Leu Ile Lys Asn Glu
675 680 685

Val Arg Met Met Met Ser Cys Ile Ala Tyr Asn Leu Tyr Leu Phe Leu
690 695 700

00593701501

[illegible]

Lys His Leu Ala Gly Gly Asp Phe Gln Thr Leu Thr Ile Lys Arg Phe
705 710 715 720

Arg His Leu Phe Leu His Val Val Gly Lys Cys Val Arg Thr Gly Arg
725 730 735

Lys Gln Leu Leu Lys Leu Ser Ser Leu Tyr Ala Tyr Ser Glu Leu Phe
740 745 750

Ser Ala Leu Tyr Ser Arg Ile Arg Lys Val Asn Leu Asn Leu Pro Val
755 760 765

Pro Tyr Glu Pro Pro Arg Arg Lys Ala Ser Leu Met Met His
770 775 780

<210> 76

<211> 414

<212> PRT

<213> Streptococcus pneumoniae

<400> 76

Met Met Glu Phe Phe Gln Gln Leu Pro His Leu Glu Pro Tyr Gly Asn
1 5 10 15

Pro Gln Tyr Phe Val Tyr Val Ile Ala Ala Thr Leu Pro Ile Phe Ile
20 25 30

Gly Leu Phe Phe Lys Lys Arg Phe Ala Trp Tyr Glu Val Leu Val Ser
35 40 45

Leu Phe Phe Ile Val Thr Met Leu Val Gly Gly Lys Thr Asn Gln Leu
50 55 60

Ala Ala Leu Gly Ile Tyr Leu Cys Trp Glu Ile Leu Leu Leu Leu Phe
65 70 75 80

177

Tyr Lys His Tyr Arg Lys Ser Lys Asp Gly Lys Trp Val Phe Tyr Leu
85 90 95

Val Ser Phe Leu Ser Leu Leu Pro Ile Ile Phe Val Lys Val Gln Pro
100 105 110

Ala Ile Asn Gly Thr Gln Ser Leu Leu Gly Phe Leu Gly Ile Ser Tyr
115 120 125

Leu Thr Phe Arg Ser Val Gly Ile Val Ile Glu Leu Arg Asp Gly Val
130 135 140

Ile Lys Asp Phe Thr Leu Trp Glu Phe Leu Arg Phe Leu Leu Phe Met
145 150 155 160

Pro Thr Phe Ser Ser Gly Pro Ile Asp Arg Phe Lys Arg Phe Asn Glu
165 170 175

Asn Tyr Gln Ala Ile Pro Glu Arg Asp Glu Leu Met Asp Met Leu Asp
180 185 190

Glu Ser Val Arg Tyr Ile Met Trp Gly Phe Leu Tyr Lys Phe Ile Leu
195 200 205

Ala His Val Leu Gly Glu Thr Leu Leu Pro Pro Leu Lys Asn Leu Ala
210 215 220

Leu Gln Ser Gly Gly Phe Phe Asn Leu Tyr Ala Leu Ala Val Met Tyr
225 230 235 240

Thr Phe Gly Leu Glu Leu Phe Phe Asp Phe Ala Gly Tyr Ser Met Phe
245 250 255

Ala Leu Ala Ile Ser Asn Leu Met Gly Ile Arg Ser Pro Ile Asn Phe
260 265 270

Asn Lys Pro Phe Leu Ser Arg Asp Leu Lys Glu Phe Trp Asn Arg Trp
275 280 285

00769797 013504

178

His Met Ser Leu Ser Phe Trp Phe Arg Asp Phe Val Phe Met Arg Met
290 295 300

Val Met Val Leu Thr Arg Lys Lys Val Phe Lys Asn Arg Asn Val Thr
305 310 315 320

Ser Ser Met Ala Tyr Ile Val Asn Met Leu Ile Met Gly Phe Trp His
325 330 335

Gly Val Thr Trp Tyr Tyr Ile Ala Tyr Gly Leu Phe His Gly Leu Gly
340 345 350

Leu Val Ile Asn Asp Ala Trp Val Arg Lys Lys Lys Thr Leu Asn Lys
355 360 365

Glu Arg Lys Lys Ala Gly Lys Ala Ala Leu Pro Glu Asn Arg Trp Ile
370 375 380

Gln Leu Leu Gly Met Val Val Thr Phe His Val Val Met Leu Ser Phe
385 390 395 400

Leu Ile Phe Ser Gly Phe Leu Asn Asn Leu Trp Phe Lys Lys
405 410

<210> 77

<211> 422

<212> PRT

<213> Streptococcus pneumoniae

<400> 77

Met Leu Lys Arg Leu Trp Met Ile Phe Gly Pro Val Leu Ile Ala Gly
1 5 10 15

Leu Leu Val Phe Leu Leu Ile Phe Phe Tyr Pro Thr Glu Met His His
20 25 30

Tyr Val Asn Tyr Asp Lys His Val Ala Lys Tyr Leu Lys Ile Leu Pro
225 230 235 240

Variable	Mean	Standard deviation	Minimum	Maximum
Age	34.5	10.5	20	55
Gender	0.5	0.5	0	1
Marital status	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	15.5	5.5	10	25
Health	0.5	0.5	0	1
Religion	0.5	0.5	0	1
Occupation	0.5	0.5	0	1
Political party	0.5	0.5	0	1
Home ownership	0.5	0.5	0	1
Auto ownership	0.5	0.5	0	1
Life insurance	0.5	0.5	0	1
Health insurance	0.5	0.5	0	1
Retirement savings	0.5	0.5	0	1
Charitable contributions	0.5	0.5	0	1
Volunteer work	0.5	0.5	0	1
Political participation	0.5	0.5	0	1
Community involvement	0.5	0.5	0	1
Environmental concern	0.5	0.5	0	1
Quality of life	0.5	0.5	0	1
Satisfaction with life	0.5	0.5	0	1
Life expectancy	75.5	5.5	65	85
Healthcare costs	15.5	5.5	10	25
Healthcare access	0.5	0.5	0	1
Healthcare quality	0.5	0.5	0	1
Healthcare equity	0.5	0.5	0	1
Healthcare sustainability	0.5	0.5	0	1
Healthcare innovation	0.5	0.5	0	1
Healthcare reform	0.5	0.5	0	1
Healthcare policy	0.5	0.5	0	1
Healthcare legislation	0.5	0.5	0	1
Healthcare regulation	0.5	0.5	0	1
Healthcare oversight	0.5	0.5	0	1
Healthcare accountability	0.5	0.5	0	1
Healthcare transparency	0.5	0.5	0	1
Healthcare integrity	0.5	0.5	0	1
Healthcare ethics	0.5	0.5	0	1
Healthcare justice	0.5	0.5	0	1
Healthcare fairness	0.5	0.5	0	1
Healthcare equity	0.5	0.5	0	1
Healthcare sustainability	0.5	0.5	0	1
Healthcare innovation	0.5	0.5	0	1
Healthcare reform	0.5	0.5	0	1
Healthcare policy	0.5	0.5	0	1
Healthcare legislation	0.5	0.5	0	1
Healthcare regulation	0.5	0.5	0	1
Healthcare oversight	0.5	0.5	0	1
Healthcare accountability	0.5	0.5	0	1
Healthcare transparency	0.5	0.5	0	1
Healthcare integrity	0.5	0.5	0	1
Healthcare ethics	0.5	0.5	0	1
Healthcare justice	0.5	0.5	0	1
Healthcare fairness	0.5	0.5	0	1
Healthcare equity	0.5	0.5	0	1
Healthcare sustainability	0.5	0.5	0	1
Healthcare innovation	0.5	0.5	0	1
Healthcare reform	0.5	0.5	0	1
Healthcare policy	0.5	0.5	0	1
Healthcare legislation	0.5	0.5	0	1
Healthcare regulation	0.5	0.5	0	1
Healthcare oversight	0.5	0.5	0	1
Healthcare accountability	0.5	0.5	0	1
Healthcare transparency	0.5	0.5	0	1
Healthcare integrity	0.5	0.5	0	1
Healthcare ethics	0.5	0.5	0	1
Healthcare justice	0.5	0.5	0	1
Healthcare fairness	0.5	0.5	0	1
Healthcare equity	0.5	0.5	0	1
Healthcare sustainability	0.5	0.5	0	1
Healthcare innovation	0.5	0.5	0	1
Healthcare reform	0.5	0.5	0	1
Healthcare policy	0.5	0.5	0	1
Healthcare legislation	0.5	0.5	0	1
Healthcare regulation	0.5	0.5	0	1
Healthcare oversight	0.5	0.5	0	1
Healthcare accountability	0.5	0.5	0	1
Healthcare transparency	0.5	0.5	0	1
Healthcare integrity	0.5	0.5	0	1
Healthcare ethics	0.5	0.5	0	1
Healthcare justice	0.5	0.5	0	1
Healthcare fairness	0.5	0.5	0	1
Healthcare equity	0.5	0.5	0	1
Healthcare sustainability	0.5	0.5	0	1
Healthcare innovation	0.5	0.5	0	1
Healthcare reform				

Asp Val Lys Glu Phe Gln
420

<211> 206

<212> PRT

<213> Streptococcus pneumoniae

<400> 78

Met Glu Lys Asn Leu Lys Ala Leu Lys Gln Thr Thr Asp Gln Glu Gly
1 5 10 15

Pro Ala Ile Glu Pro Glu Lys Ala Glu Asp Thr Lys Thr Val Gln Asn
20 25 30

Gly Tyr Phe Glu Asp Ala Ala Val Lys Asp Arg Thr Leu Ser Asp Tyr
35 40 45

Ala Gly Asn Trp Gln Ser Val Tyr Pro Phe Leu Glu Asp Gly Thr Phe
50 55 60

Asp Gln Val Phe Asp Tyr Lys Ala Lys Leu Thr Gly Lys Met Thr Gln
65 70 75 80

Ala Glu Tyr Lys Ala Tyr Tyr Thr Lys Gly Tyr His Thr Asp Val Thr
85 90 95

Lys Ile Asn Ile Thr Asp Asn Thr Met Glu Phe Val Gln Gly Gly Gln
100 105 110

Ser Lys Lys Tyr Thr Tyr Lys Tyr Val Gly Lys Lys Ile Leu Thr Tyr
115 120 125

Lys Lys Gly Asn Arg Gly Val Arg Phe Leu Phe Glu Ala Thr Asp Ala
130 135 140

Asp Ala Gly Gln Phe Lys Tyr Val Gln Phe Ser Asp His Asn Val Ala
145 150 155 160

Pro Val Lys Ala Glu His Phe His Ile Phe Phe Gly Gly Thr Ser Gln
165 170 175

182

Glu Ala Leu Phe Glu Glu Met Asp Asn Trp Pro Thr Tyr Tyr Pro Asp
180 185 190

Asn Leu Ser Gly Gln Glu Ile Ala Gln Glu Met Leu Ala His
195 200 205

<210> 79

<211> 147

<212> PRT

<213> Streptococcus pneumoniae

<400> 79

Met Lys Asp Gly His Leu Leu Ala His His Ile Arg Leu Leu Asn Gly
1 5 10 15

Arg Ile Phe Gln Lys Leu Leu Ser Gln Asp Pro Glu Ala Leu Tyr Arg
20 25 30

Gly Glu Gln Gly Lys Ile Leu Ala Val Leu Trp Asn Ser Glu Thr Gly
35 40 45

Cys Ala Thr Ala Thr Asp Ile Ala Leu Ala Thr Gly Leu Ala Asn Asn
50 55 60

Thr Leu Thr Thr Met Ile Lys Lys Leu Glu Glu Gln Lys Leu Val Ile
65 70 75 80

Val Ser Pro Cys Gly Lys Asp Lys Arg Lys Lys Tyr Leu Val Leu Thr
85 90 95

Glu Leu Gly Lys Ser Gln Lys Glu Val Gly His Arg Val Ser Gln Lys
100 105 110

Leu Asp Thr Ile Phe Tyr Lys Gly Phe Ser Glu Glu Glu Ile His Gln
115 120 125

105610 030300

Glu Ala Gly Ile Ala Phe Gly Met Thr Arg Trp Glu Arg Leu Lys Lys
115 120 125

[illegible]

Ala Ala Val Leu Ile Ile Gly Thr Ala Thr Leu Ala Ala Leu Ile Gly
145 150 155 160

Ala Gly Gly Leu Gly Ser Phe Ile Leu Leu Gly Ile Asp Arg Asn Asn
165 170 175

Ala Ser Leu Ile Leu Ile Gly Ala Leu Ser Ser Ala Val Leu Ala Ile
180 185 190

Ala Phe Asn Phe Leu Leu Lys Val Met Glu Lys Ala Lys Leu Arg Thr
195 200 205

Ile Phe Ser Gly Phe Ala Leu Val Ala Leu Leu Leu Gly Leu Ser Tyr
210 215 220

Ser Pro Ala Leu Leu Val Gln Lys Glu Lys Glu Asn Leu Val Ile Ala
225 230 235 240

Gly Lys Ile Gly Pro Glu Pro Glu Ile Leu Ala Asn Met Tyr Lys Leu
245 250 255

Leu Ile Glu Glu Asn Thr Ser Met Thr Ala Thr Val Lys Pro Asn Phe
260 265 270

Gly Lys Thr Ser Phe Leu Tyr Glu Ala Leu Lys Lys Gly Asp Ile Asp
275 280 285

Ile Tyr Pro Glu Phe Thr Gly Thr Val Thr Glu Ser Leu Leu Gln Pro
290 295 300

Ser Pro Lys Val Ser His Glu Pro Glu Gln Val Tyr Gln Val Ala Arg
305 310 315 320

Asp Gly Ile Ala Lys Gln Asp His Leu Ala Tyr Leu Lys Pro Met Ser
325 330 335

185

Tyr Gln Asn Thr Tyr Ala Val Ala Val Pro Lys Lys Ile Ala Gln Glu
340 345 350

Tyr Gly Leu Lys Thr Ile Ser Asp Leu Lys Lys Val Glu Gly Gln Leu
355 360 365

Lys Ala Gly Phe Thr Leu Glu Phe Asn Asp Arg Glu Asp Gly Asn Lys
370 375 380

Gly Leu Gln Ser Met Tyr Gly Leu Asn Leu Asn Val Ala Thr Ile Glu
385 390 395 400

Pro Ala Leu Arg Tyr Gln Ala Ile Gln Ser Gly Asp Ile Gln Ile Thr
405 410 415

Asp Ala Tyr Ser Thr Asp Ala Glu Leu Glu Arg Tyr Asp Leu Gln Val
420 425 430

Leu Glu Asp Asp Lys Gln Leu Phe Pro Pro Tyr Gln Gly Ala Pro Leu
435 440 445

Met Lys Glu Ala Leu Leu Lys Lys His Pro Glu Leu Glu Arg Val Leu
450 455 460

Asn Thr Leu Ala Gly Lys Ile Thr Glu Ser Gln Met Ser Gln Leu Asn
465 470 475 480

Tyr Gln Val Gly Val Glu Gly Lys Ser Ala Lys Gln Val Ala Lys Glu
485 490 495

Phe Leu Gln Glu Gln Gly Leu Leu Lys Lys
500 505

00560701501

<211> 269

<213> Streptococcus pneumoniae

Met Met His Thr Tyr Leu Gln Lys Lys Ile Glu Asn Ile Lys Thr Thr

1

5

10

15

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35

40

45

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105

110

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120

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165 .

170

175

187

Trp Trp Leu Ala Phe Gly Phe Ile Tyr Gln Ser Ile Gly Ala Asn Arg
180 185 190

Pro Tyr Arg Asp Ser Ile Thr Asp Ala Thr Asn Gly Val Gly Gln Ile
195 200 205

Leu Met Thr Ala Val Tyr Arg Glu Gln Trp Ile Phe Trp Ala Ala Thr
210 215 220

Asn Val Phe Ser Ile Tyr Leu Trp Trp Gly Glu Ser Leu Gln Ile Gln
225 230 235 240

Gly Lys Tyr Leu Ile Tyr Leu Ile Asn Ser Leu Val Gly Trp Tyr Gln
245 250 255

Trp Ser Lys Ala Ala Lys Gln Asn Thr Asp Leu Leu Asn
260 265

<210> 82

<211> 299

<212> PRT

<213> Streptococcus pneumoniae

<400> 82

Met Arg Asn Met Lys Ala Lys Tyr Ala Val Trp Val Ala Phe Phe Leu
1 5 10 15

Asn Leu Thr Tyr Ala Ile Val Glu Phe Ile Ala Gly Gly Val Phe Gly
20 25 30

Ser Ser Ala Val Leu Ala Asp Ser Val His Asp Leu Gly Asp Ala Ile
35 40 45

Ala Ile Gly Ile Ser Ala Phe Leu Glu Thr Ile Ser Asn Arg Glu Glu
50 55 60

00969707 042604

188

Asp Asn Gln Tyr Thr Leu Gly Tyr Lys Arg Phe Ser Leu Leu Gly Ala
65 70 75 80

Leu Val Thr Ala Val Ile Leu Val Thr Gly Ser Val Leu Val Ile Leu
85 90 95

Glu Asn Val Thr Lys Ile Leu His Pro Gln Pro Val Asn Asp Glu Gly
100 105 110

Ile Leu Trp Leu Gly Ile Ile Ala Ile Thr Ile Asn Leu Leu Ala Ser
115 120 125

Leu Val Val Gly Lys Gly Lys Thr Lys Asn Glu Ser Ile Leu Ser Leu
130 135 140

His Phe Leu Glu Asp Thr Leu Gly Trp Val Ala Val Ile Leu Met Ala
145 150 155 160

Ile Val Leu Arg Phe Thr Asp Trp Tyr Ile Leu Asp Pro Leu Leu Ser
165 170 175

Leu Val Ile Ser Phe Phe Ile Leu Ser Lys Ala Leu Pro Arg Phe Trp
180 185 190

Ser Thr Leu Lys Ile Phe Leu Asp Ala Val Pro Glu Gly Leu Asp Ile
195 200 205

Lys Gln Val Lys Ser Gly Leu Glu Arg Leu Asp Asn Val Ala Ser Leu
210 215 220

Asn Gln Leu Asn Leu Trp Thr Met Asp Ala Leu Glu Lys Asn Ala Ile
225 230 235 240

Val His Val Cys Leu Lys Glu Met Glu His Met Glu Thr Cys Lys Glu
245 250 255

Ser Ile Arg Ile Phe Leu Lys Asp Cys Gly Phe Gln Asn Ile Thr Ile
260 265 270

009697.04604
F09210.2846960

Glu Ile Asp Ala Asp Leu Glu Thr His Gln Thr His Lys Arg Lys Val
 275 280 285

Cys Asp Leu Glu Arg Ser Tyr Glu His Gln His
 290 295

<210> 83

<211> 242

<212> PRT

<213> Streptococcus pneumoniae

<400> 83

Met Ile Glu Tyr Lys Asn Val Ala Leu Arg Tyr Thr Glu Lys Asp Val
 1 5 10 15

Leu Arg Asp Val Asn Leu Gln Ile Glu Asp Gly Glu Phe Met Val Leu
 20 25 30

Val Gly Pro Ser Gly Ser Gly Lys Thr Thr Met Leu Lys Met Ile Asn
 35 40 45

Arg Leu Leu Glu Pro Thr Asp Gly Asn Ile Tyr Met Asp Gly Lys Arg
 50 55 60

Ile Lys Asp Tyr Asp Glu Arg Glu Leu Arg Leu Ser Thr Gly Tyr Val
 65 70 75 80

Leu Gln Ala Ile Ala Leu Phe Pro Asn Leu Thr Val Ala Glu Asn Ile
 85 90 95

Ala Leu Ile Pro Glu Met Lys Gly Trp Ser Lys Glu Glu Ile Thr Lys
 100 105 110

Lys Thr Glu Glu Leu Leu Ala Lys Val Gly Leu Pro Val Ala Glu Tyr
 115 120 125

Gly His Arg Leu Pro Ser Glu Leu Ser Gly Gly Glu Gln Gln Arg Val
 130 135 140

009597-0486

190

Gly Ile Val Arg Ala Met Ile Gly Gln Pro Lys Ile Phe Leu Met Asp
145 150 155 160

Glu Pro Phe Ser Ala Leu Asp Ala Ile Ser Arg Lys Gln Leu Gln Val
165 170 175

Leu Thr Lys Glu Leu His Lys Glu Phe Gly Met Thr Thr Ile Phe Val
180 185 190

Thr His Asp Thr Asp Glu Ala Leu Lys Leu Ala Asp Arg Ile Ala Val
195 200 205

Leu Gln Asp Gly Glu Ile Arg Gln Val Ala Asn Pro Glu Thr Ile Leu
210 215 220

Lys Ala Pro Ala Thr Asp Phe Val Ala Asp Leu Phe Gly Gly Ser Val
225 230 235 240

His Asp

<210> 84

<211> 360

<212> PRT

<213> Streptococcus pneumoniae

<400> 84

Met Ser Ala Val Ala Ile Ser Ala Met Thr Lys Val Met Gln Glu Thr
1 5 10 15

His Gly Asn Pro Ser Ser Ile His Gly His Gly Arg Gln Ala Gly Lys
20 25 30

Leu Leu Arg Glu Ala Arg Gln Glu Leu Ala Gln Leu Leu Arg Thr Lys
35 40 45

007697 013604

191

Pro Gln His Ile Phe Phe Thr Ser Gly Gly Thr Glu Gly Asn Asn Thr
50 55 60

Thr Ile Ile Gly Tyr Cys Leu Arg His Gln Glu Gln Gly Lys His Ile
65 70 75 80

Ile Thr Thr Ala Ile Glu His His Ala Val Leu Glu Thr Ile Asp Tyr
85 90 95

Leu Val Gln His Phe Gly Phe Glu Ala Thr Ile Ile Gln Pro Glu Asn
100 105 110

Gln Glu Ile Thr Ala Gln Gln Ile Gln Lys Ala Leu Arg Asp Asp Thr
115 120 125

Ile Leu Val Ser Thr Met Phe Val Asn Asn Glu Thr Gly Asn Leu Leu
130 135 140

Pro Ile Ala Glu Ile Gly Gln Ile Leu Lys Gln His Pro Ala Ala Tyr
145 150 155 160

His Val Asp Ala Val Gln Ala Ile Gly Lys Ile Pro Ile His Ser Glu
165 170 175

Glu Leu Gly Ile Asp Phe Leu Thr Ala Ser Ala His Lys Phe His Gly
180 185 190

Pro Lys Gly Ile Gly Phe Leu Tyr Ala Ser Ser Met Asp Phe Asp Ser
195 200 205

Tyr Leu His Gly Gly Asp Gln Glu Gln Lys Lys Arg Ala Gly Thr Glu
210 215 220

Asn Leu Pro Ala Ile Val Gly Met Val Ala Ala Leu Lys Glu Asp Leu
225 230 235 240

Glu Lys Gln Glu Glu His Phe Gln His Val Gln Asn Leu Glu Thr Ala
245 250 255

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[illegible]

Leu Gly Ser Leu Leu Leu Ser Leu Pro Phe Val Gln Val Glu Ser Ser
35 40 45

193

Arg Ala Thr Tyr Phe Asp His Leu Phe Thr Ala Val Ser Ala Val Cys
50 55 60

Val Thr Gly Leu Ser Thr Leu Pro Val Ala His Thr Tyr Asn Ile Trp
65 70 75 80

Gly Gln Ile Ile Cys Leu Leu Leu Ile Gln Ile Gly Gly Leu Gly Leu
85 90 95

Met Thr Phe Ile Gly Val Phe Tyr Ile Gln Ser Lys Gln Lys Leu Ser
100 105 110

Leu Arg Ser Arg Ala Thr Ile Gln Asp Ser Phe Ser Tyr Gly Glu Thr
115 120 125

Arg Ser Leu Arg Lys Phe Val Tyr Ser Ile Phe Leu Thr Thr Phe Leu
130 135 140

Val Glu Ser Leu Gly Ala Ile Leu Leu Ser Phe Arg Leu Ile Pro Gln
145 150 155 160

Leu Gly Trp Gly Arg Gly Leu Phe Ser Ser Ile Phe Leu Ala Ile Ser
165 170 175

Ala Phe Cys Asn Ala Gly Phe Asp Asn Leu Gly Ser Thr Ser Leu Phe
180 185 190

Ala Phe Gln Thr Asp Leu Leu Val Asn Leu Val Ile Ala Gly Leu Ile
195 200 205

Ile Thr Gly Gly Leu Gly Phe Met Val Trp Phe Asp Leu Ala Gly His
210 215 220

Val Gly Arg Lys Lys Lys Gly Arg Leu His Phe His Thr Lys Leu Val
225 230 235 240

Leu Leu Leu Thr Ile Gly Leu Leu Leu Phe Gly Thr Ala Thr Thr Leu
245 250 255

0076937 012604

194

Phe Leu Glu Trp Asn Asn Ala Gly Thr Ile Gly Asn Leu Pro Val Ala
260 265 270

Asp Lys Val Leu Val Ser Phe Phe Gln Thr Val Thr Met Arg Thr Ala
275 280 285

Gly Phe Ser Thr Ile Asp Tyr Thr Gln Ala His Pro Val Thr Leu Leu
290 295 300

Ile Tyr Ile Leu Gln Met Phe Leu Gly Gly Ala Pro Gly Gly Thr Ala
305 310 315 320

Gly Gly Leu Lys Ile Thr Thr Phe Phe Val Leu Leu Val Phe Ala Arg
325 330 335

Ser Glu Leu Leu Gly Leu Pro His Ala Asn Val Ala Arg Arg Thr Ile
340 345 350

Ala Pro Arg Thr Val Gln Lys Ser Phe Ser Val Phe Ile Ile Phe Leu
355 360 365

Met Ser Phe Leu Ile Gly Leu Ile Leu Leu Gly Ile Thr Ala Lys Gly
370 375 380

Asn Pro Pro Phe Ile His Leu Val Phe Glu Thr Ile Ser Ala Leu Ser
385 390 395 400

Thr Val Gly Val Thr Ala Asn Leu Thr Pro Asp Leu Gly Lys Leu Ala
405 410 415

Leu Ser Val Ile Met Pro Leu Met Phe Met Gly Arg Ile Gly Pro Leu
420 425 430

Thr Leu Phe Val Ser Leu Ala Asp Tyr His Pro Glu Lys Lys Asp Met
435 440 445

Ile His Tyr Met Lys Ala Asp Ile Ser Ile Gly
450 455

005210 0969260

<211> 221

<213> Streptococcus pneumoniae

Met Ser Asp Arg Thr Ile Gly Ile Leu Gly Leu Gly Ile Phe Gly Ser
1 5 10 15

Ser Val Leu Ala Ala Leu Ala Lys Gln Asp Met Asn Ile Ile Ala Ile
20 25 30

Asp Asp His Ala Glu Arg Ile Asn Gln Phe Glu Pro Val Leu Ala Arg
35 40 45

Gly Val Ile Gly Asp Ile Thr Asp Glu Glu Leu Leu Arg Ser Ala Gly
50 55 60

Ile Asp Thr Cys Asp Thr Val Val Val Ala Thr Gly Glu Asn Leu Glu
65 70 75 80

Ser Ser Val Leu Ala Val Met His Cys Lys Ser Leu Gly Val Pro Thr
85 90 95

Val Ile Ala Lys Val Lys Ser Gln Thr Ala Lys Lys Val Leu Glu Lys
100 105 110

Ile Gly Ala Asp Ser Val Ile Ser Pro Glu Tyr Glu Met Gly Gln Ser
115 120 125

Leu Ala Gln Thr Ile Leu Phe His Asn Ser Val Asp Val Phe Gln Leu
130 135 140

Asp Lys Asn Val Ser Ile Val Glu Met Lys Ile Pro Gln Ser Trp Ala
145 150 155 160

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
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Ser Gly Arg Tyr Phe Lys Val Val Asp Ser Asp Asp Trp Val Asp Pro
85 90 95

[illegible]

Pro Gly Gln Val Leu Pro Glu Glu Thr Ser Gly Thr Lys Glu Gly Asp
50 55 60

198

Leu Ser Glu Lys Pro Gly Asp Thr Val Leu Thr Gln Ala Lys Pro Glu
65 70 75 80

Gly Val Thr Gly Asn Thr Asn Ser Leu Pro Thr Pro Thr Glu Arg Thr
85 90 95

Glu Val Ser Glu Glu Thr Ser Pro Ser Ser Leu Asp Thr Leu Phe Glu
100 105 110

Lys Asp Glu Glu Ala Gln Lys Asn Pro Glu Leu Thr Asp Val Leu Lys
115 120 125

Glu Thr Val Asp Thr Ala Asp Val Asp Gly Thr Gln Ala Ser Pro Ala
130 135 140

Glu Thr Thr Pro Glu Gln Val Lys Gly Gly Val Lys Glu Asn Thr Lys
145 150 155 160

Asp Ser Ile Asp Val Pro Ala Ala Tyr Leu Glu Lys Ala Glu Gly Lys
165 170 175

Gly Pro Phe Thr Ala Gly Val Asn Gln Val Ile Pro Tyr Glu Leu Phe
180 185 190

Ala Gly Asp Gly Met Leu Thr Arg Leu Leu Leu Lys Ala Ser Asp Asn
195 200 205

Ala Pro Trp Ser Asp Asn Gly Thr Ala Lys Asn Pro Ala Leu Pro Pro
210 215 220

Leu Glu Gly Leu Thr Lys Gly Lys Tyr Phe Tyr Glu Val Asp Leu Asn
225 230 235 240

Gly Asn Thr Val Gly Lys Gln Gly Gln Ala Leu Ile Asp Gln Leu Arg
245 250 255

Ala Asn Gly Thr Gln Thr Tyr Lys Ala Thr Val Lys Val Tyr Gly Asn
260 265 270

003693 01364
109210 15269260

Ile Asp Val Pro Ala Ala Tyr Leu Glu Lys Ala Lys Gly Glu Gly Pro
465 470 475 480

200

Phe Thr Ala Gly Val Asn His Val Ile Pro Tyr Glu Leu Phe Ala Gly
485 490 495

Asp Gly Met Leu Thr Arg Leu Leu Leu Lys Ala Ser Asp Lys Ala Pro
500 505 510

Trp Ser Asp Asn Gly Asp Ala Lys Asn Pro Ala Leu Ser Pro Leu Gly
515 520 525

Glu Asn Val Lys Thr Lys Gly Gln Tyr Phe Tyr Gln Leu Ala Leu Asp
530 535 540

Gly Asn Val Ala Gly Lys Glu Lys Gln Ala Leu Ile Asp Gln Phe Arg
545 550 555 560

Ala Asn Gly Thr Gln Thr Tyr Ser Ala Thr Val Asn Val Tyr Gly Asn
565 570 575

Lys Asp Gly Lys Pro Asp Leu Asp Asn Ile Val Ala Thr Lys Lys Val
580 585 590

Thr Ile Asn Ile Asn Gly Leu Ile Ser Lys Glu Thr Val Gln Lys Ala
595 600 605

Val Ala Asp Asn Val Lys Thr Val Ser Met Phe Gln Gln Pro Thr
610 615 620

<210> 89

<211> 350

<212> PRT

<213> Streptococcus pneumoniae

<400> 89

Met Lys Leu Lys Ser Tyr Ile Leu Val Gly Tyr Ile Ile Ser Thr Leu

1

5

10

15

0036937 013604
109210 166660

201

Leu Thr Ile Leu Val Val Phe Trp Ala Val Gln Lys Met Leu Ile Ala
20 25 30

Lys Gly Glu Ile Tyr Phe Leu Leu Gly Met Thr Ile Val Ala Ser Leu
35 40 45

Val Gly Ala Gly Ile Ser Leu Phe Leu Leu Leu Pro Val Phe Thr Ser
50 55 60

Leu Gly Lys Leu Lys Glu His Ala Lys Arg Val Ala Ala Lys Asp Phe
65 70 75 80

Pro Ser Asn Leu Glu Val Gln Gly Pro Val Glu Phe Gln Gln Leu Gly
85 90 95

Gln Thr Phe Asn Glu Met Ser His Asp Leu Gln Val Ser Phe Asp Ser
100 105 110

Leu Glu Glu Ser Glu Arg Glu Lys Gly Leu Met Ile Ala Gln Leu Ser
115 120 125

His Asp Ile Lys Thr Pro Ile Thr Ser Ile Gln Ala Thr Val Glu Gly
130 135 140

Ile Leu Asp Gly Ile Ile Lys Glu Ser Glu Gln Ala His Tyr Leu Ala
145 150 155 160

Thr Ile Gly Arg Gln Thr Glu Arg Leu Asn Lys Leu Val Glu Glu Leu
165 170 175

Asn Phe Leu Thr Leu Asn Thr Ala Arg Asn Gln Val Glu Thr Thr Ser
180 185 190

Lys Asp Ser Ile Phe Leu Asp Lys Leu Leu Ile Glu Cys Met Ser Glu
195 200 205

Phe Gln Phe Leu Ile Glu Gln Glu Arg Arg Asp Val His Leu Gln Val
210 215 220

009973 013601

202

Ile Pro Glu Ser Ala Arg Ile Glu Gly Asp Tyr Ala Lys Leu Ser Arg
225 230 235 240

Ile Leu Val Asn Leu Val Asp Asn Ala Phe Lys Tyr Ser Ala Pro Gly
245 250 255

Thr Lys Leu Glu Val Val Ala Lys Leu Glu Lys Asp Gln Leu Ser Ile
260 265 270

Ser Val Thr Asp Glu Gly Gln Gly Ile Ala Pro Glu Asp Leu Glu Asn
275 280 285

Ile Phe Lys Arg Leu Tyr Arg Val Glu Thr Ser Arg Asn Met Lys Thr
290 295 300

Gly Gly His Gly Leu Gly Leu Ala Ile Ala Arg Glu Leu Ala His Gln
305 310 315 320

Leu Gly Gly Glu Ile Thr Val Ser Ser Gln Tyr Gly Leu Gly Ser Thr
325 330 335

Phe Thr Leu Val Leu Asn Leu Ser Gly Ser Glu Asn Lys Ala
340 345 350

<210> 90

<211> 175

<212> PRT

<213> Streptococcus pneumoniae

<400> 90

Met Phe Gly Gln Thr Ala Gln His Gly Leu Thr Asn Ser Leu Lys Asp
1 5 10 15

Phe Trp Ile Phe Leu Leu Asn Ile Gly Pro Gln Leu Ala Phe Phe Cys
20 25 30

00369787 013504

203

Gln Met Leu Arg Cys Ser Arg Ser Val Glu Gln Gly Thr Gly Asn His
35 40 45

Arg Arg Glu Phe Asn Met Ile Gln Gln Ile Phe Ser His Phe Gly Met
50 55 60

Thr His Leu Gly Gln Ile Lys Leu Val Tyr Gln Glu Ser Ile Asp Leu
65 70 75 80

Glu Leu Leu Val Asn Ala Leu Asn His His Leu Leu Ile Asp Arg Leu
85 90 95

Val Leu Thr Pro Asn Gln Ile Thr Ile Glu Ile Asp Arg Gln Ile Val
100 105 110

His Gly Leu Asp Leu Leu Lys Gly Arg Lys Asp Lys Glu Ile Ile Asp
115 120 125

Ile Lys Ser Met Phe Arg Gln Leu Glu Leu Ala Ser Thr Gln Gln Ile
130 135 140

Cys Pro Ile Asn Gln Arg Val His His Gly Ile Leu Ala Phe Gly Glu
145 150 155 160

Ile Ser Asp Leu Val Pro Ala Lys Asn Leu Pro Asn Arg Gln Asp
165 170 175

<210> 91

<211> 158

<212> PRT

<213> Streptococcus pneumoniae

<400> 91

Met Glu His Leu Ala Thr Tyr Phe Ser Thr Tyr Gly Gly Ala Phe Phe
1 5 10 15

00759797-01504

204

Ala Ala Leu Gly Ile Val Leu Ala Val Gly Leu Ser Gly Met Gly Ser
20 25 30

Ala Tyr Gly Val Gly Lys Ala Gly Gln Ser Ala Ala Ala Leu Leu Lys
35 40 45

Glu Gln Pro Glu Lys Phe Ala Ser Ala Leu Ile Leu Gln Leu Leu Pro
50 55 60

Gly Thr Gln Gly Leu Tyr Gly Phe Val Ile Gly Ile Leu Ile Trp Leu
65 70 75 80

Gln Leu Thr Pro Glu Leu Pro Leu Glu Lys Gly Val Ala Tyr Phe Phe
85 90 95

Val Ala Leu Pro Ile Ala Ile Val Gly Tyr Phe Ser Ala Lys His Gln
100 105 110

Gly Asn Val Ala Val Ala Gly Met Gln Ile Leu Ala Lys Arg Pro Lys
115 120 125

Glu Phe Met Lys Gly Ala Ile Leu Ala Ala Met Val Glu Thr Tyr Ala
130 135 140

Ile Leu Ala Phe Val Val Ser Phe Ile Leu Thr Leu Arg Val
145 150 155

<210> 92

<211> 165

<212> PRT

<213> Streptococcus pneumoniae

<400> 92

Met Leu Lys Ser Glu Lys Gln Ser Arg Tyr Gln Met Leu Asn Glu Glu
1 5 10 15

003697.013604

205

Leu Ser Phe Leu Leu Glu Gly Glu Thr Asn Val Leu Ala Asn Leu Ser
20 25 30

Asn Ala Ser Ala Leu Ile Lys Ser Arg Phe Pro Asn Thr Val Phe Ala
35 40 45

Gly Phe Tyr Leu Phe Asp Gly Lys Glu Leu Val Leu Gly Pro Phe Gln
50 55 60

Gly Gly Val Ser Cys Ile Arg Ile Ala Leu Gly Lys Gly Val Cys Gly
65 70 75 80

Glu Ala Ala His Phe Gln Glu Thr Val Ile Val Gly Asp Val Thr Thr
85 90 95

Tyr Leu Asn Tyr Ile Ser Cys Asp Ser Leu Ala Lys Ser Glu Ile Val
100 105 110

Val Pro Met Met Lys Asn Gly Gln Leu Leu Gly Val Leu Asp Leu Asp
115 120 125

Ser Ser Glu Ile Glu Asp Tyr Asp Ala Met Asp Arg Asp Tyr Leu Glu
130 135 140

Gln Phe Val Ala Ile Leu Leu Glu Lys Thr Ala Trp Asp Phe Thr Met
145 150 155 160

Phe Glu Glu Lys Ser
165

00769767-012604
105210-282660

<210> 93

<211> 256

<212> PRT

<213> Streptococcus pneumoniae

<400> 93

Met Ser Val Leu Glu Ile Lys Asp Leu His Val Glu Ile Glu Gly Lys

1

5

10

15

Glu Ile Leu Lys Gly Val Asn Leu Thr Leu Lys Thr Gly Glu Ile Ala

20

25

30

Ala Ile Met Gly Pro Asn Gly Thr Gly Lys Ser Thr Leu Ser Ala Ala

35

40

45

Ile Met Gly Asn Pro Asn Tyr Glu Val Thr Lys Gly Glu Val Leu Phe

50

55

60

Asp Gly Val Asn Ile Leu Glu Leu Glu Val Asp Glu Arg Ala Arg Met

65

70

75

80

Gly Leu Phe Leu Ala Met Gln Tyr Pro Ser Glu Ile Pro Gly Ile Thr

85

90

95

Asn Ala Glu Phe Leu Arg Ala Ala Met Asn Ala Gly Lys Glu Asp Asp

100

105

110

Glu Lys Ile Ser Val Arg Glu Phe Ile Thr Lys Leu Asp Glu Lys Met

115

120

125

Glu Leu Leu Asn Met Lys Glu Glu Met Ala Glu Arg Tyr Leu Asn Glu

130

135

140

Gly Phe Ser Gly Gly Glu Lys Lys Arg Asn Glu Ile Leu Gln Leu Leu

145

150

155

160

Met Leu Glu Pro Thr Phe Ala Leu Leu Asp Glu Ile Asp Ser Gly Leu

165

170

175

00369757-043604

207

Asp Ile Asp Ala Leu Lys Val Val Ser Lys Gly Val Asn Ala Met Arg
180 185 190

Gly Glu Gly Phe Gly Ala Met Ile Ile Thr His Tyr Gln Arg Leu Leu
195 200 205

Asn Tyr Ile Thr Pro Asp Val Val His Val Met Met Glu Gly Arg Val
210 215 220

Val Leu Ser Gly Gly Pro Glu Leu Ala Ala Arg Leu Glu Arg Glu Gly
225 230 235 240

Tyr Ala Lys Leu Ala Glu Glu Leu Gly Tyr Asp Tyr Lys Glu Glu Leu
245 250 255

<210> 94

<211> 156

<212> PRT

<213> Streptococcus pneumoniae

<400> 94

Met Pro Tyr Lys Arg Gln Arg Ser Phe Ser Met Ala Leu Ser Lys Leu
1 5 10 15

Asp Ser Leu Tyr Met Ala Val Val Ala Asp His Ser Lys Asn Pro His
20 25 30

His Gln Gly Lys Leu Glu Asp Ala Glu Gln Ile Ser Leu Asn Asn Pro
35 40 45

Thr Cys Gly Asp Val Ile Asn Leu Ser Val Lys Phe Asp Ala Glu Asp
50 55 60

005678-0460

[illegible]

Leu Ala Arg Glu Ala Leu Thr Ser Thr Gly Leu Gly Asp Gly Ile Ala
50 55 60

209

Met Pro His Ser Lys Asn Ala Ala Val Lys Glu Ala Thr Val Leu Phe
65 70 75 80

Ala Lys Ser Asn Lys Gly Val Asp Tyr Glu Ser Leu Asp Gly Gln Ala
85 90 95

Thr Asp Leu Phe Phe Met Ile Ala Ala Pro Glu Gly Ala Asn Asp Thr
100 105 110

His Leu Ala Ala Leu Ala Glu Leu Ser Gln Tyr Leu Met Lys Asp Gly
115 120 125

Phe Ala Asp Lys Leu Arg Gln Ala Thr Ser Ala Asp Gln Val Ile Glu
130 135 140

Leu Phe Asp Gln Ala Ser Glu Lys Thr Glu Glu Leu Val Gln Ala Pro
145 150 155 160

Ala Asn Asp Ser Gly Asp Phe Ile Val Ala Val Thr Ala Cys Thr Thr
165 170 175

Gly Ile Ala His Thr Tyr Met Ala Gln Glu Ala Leu Gln Lys Val Ala
180 185 190

Ala Glu Met Gly Val Gly Ile Lys Val Glu Thr Asn Gly Ala Ser Gly
195 200 205

Val Gly Asn Gln Leu Thr Ala Glu Asp Ile Arg Lys Ala Lys Ala Ile
210 215 220

Ile Ile Ala Ala Asp Lys Ala Val Glu Met Asp Arg Phe Asp Gly Lys
225 230 235 240

Pro Leu Ile Asn Arg Pro Val Ala Asp Gly Ile Arg Lys Thr Glu Glu
245 250 255

Leu Ile Asn Leu Ala Leu Ser Gly Asp Thr Glu Val Tyr Arg Ala Ala
260 265 270

00769797 043604

210

Asn Gly Ala Lys Ala Ala Thr Ala Ser Asn Glu Lys Gln Ser Leu Gly
275 280 285

Gly Ala Leu Tyr Lys His Leu Met Ser Gly Val Ser Gln Met Leu Pro
290 295 300

Phe Val Ile Gly Gly Gly Ile Met Ile Ala Leu Ala Phe Leu Ile Asp
305 310 315 320

Gly Ala Leu Gly Val Pro Asn Glu Asn Leu Gly Asn Leu Gly Ser Tyr
325 330 335

His Glu Leu Ala Ser Met Phe Met Lys Ile Gly Gly Ala Ala Phe Gly
340 345 350

Leu Met Leu Pro Val Phe Ala Gly Tyr Val Ala Tyr Ser Ile Ala Glu
355 360 365

Lys Pro Gly Leu Val Ala Gly Phe Val Ala Gly Ala Ile Ala Lys Glu
370 375 380

Gly Phe Ala Phe Gly Lys Ile Pro Tyr Ala Ala Gly Gly Glu Ala Thr
385 390 395 400

Ser Thr Leu Ala Gly Val Ser Ser Gly Phe Leu Gly Ala Leu Val Gly
405 410 415

Gly Phe Ile Ala Gly Ala Leu Val Leu Ala Ile Lys Lys Tyr Val Lys
420 425 430

Val Pro Arg Ser Leu Glu Gly Ala Lys Ser Ile Leu Leu Leu Pro Leu
435 440 445

Leu Gly Thr Ile Leu Thr Gly Phe Val Met Leu Ala Val Asn Ile Pro
450 455 460

Met Ala Ala Ile Asn Thr Ala Met Asn Asp Phe Leu Gly Gly Leu Gly
465 470 475 480

00760757 013504

[illegible]

Val Asp Met Gly Gly Pro Val Asn Lys Ala Ala Tyr Val Phe Gly Thr
500 505 510

Gly Thr Leu Ala Ala Thr Val Ser Ser Gly Gly Ser Val Ala Met Ala
515 520 525

Ala Val Met Ala Gly Gly Met Val Pro Pro Leu Ala Ile Phe Val Ala
530 535 540

Thr Leu Leu Phe Lys Asp Lys Phe Thr Lys Glu Glu Arg Asn Ser Gly
545 550 555 560

Leu Thr Asn Ile Ile Met Gly Leu Ser Phe Ile Thr Glu Gly Ala Ile
565 570 575

Pro Phe Gly Ala Ala Asp Pro Ala Arg Ala Ile Pro Ser Phe Ile Leu
580 585 590

Gly Ser Ala Val Ala Gly Gly Leu Val Gly Leu Thr Gly Ile Lys Leu
595 600 605

Met Ala Pro His Gly Gly Ile Phe Val Ile Ala Leu Thr Ser Asn Ala
610 615 620

Leu Leu Tyr Leu Val Ser Val Leu Val Gly Ala Ile Val Ser Gly Val
625 630 635 640

Val Tyr Gly Tyr Leu Arg Lys Pro Gln Ala
645 650

<213> Streptococcus pneumoniae

165 170 175

[illegible]

Leu Ser Asp Asp Leu Ala Leu Ala Leu Ala Ala Lys Asp Val Arg Ile
370 375 380

214

Glu Ala Pro Ile Pro Gly Lys Ser Leu Ile Gly Ile Glu Val Pro Asn
385 390 395 400

Ser Asp Ile Ala Thr Val Ser Phe Arg Glu Leu Trp Glu Gln Ser Gln
405 410 415

Thr Lys Ala Glu Asn Phe Leu Glu Ile Pro Leu Gly Lys Ala Val Asn
420 425 430

Gly Thr Ala Arg Ala Phe Asp Leu Ser Lys Met Pro His Leu Leu Val
435 440 445

Ala Gly Ser Thr Gly Ser Gly Lys Ser Val Ala Val Asn Gly Ile Ile
450 455 460

Ala Ser Ile Leu Met Lys Ala Arg Pro Asp Gln Val Lys Phe Met Met
465 470 475 480

Val Asp Pro Lys Met Val Glu Leu Ser Val Tyr Asn Asp Ile Pro His
485 490 495

Leu Leu Ile Pro Val Val Thr Asn Pro Arg Lys Ala Ser Lys Ala Leu
500 505 510

Gln Lys Val Val Asp Glu Met Glu Asn Arg Tyr Glu Leu Phe Ala Lys
515 520 525

Val Gly Val Arg Asn Ile Ala Gly Phe Asn Ala Lys Val Glu Glu Phe
530 535 540

Asn Ser Gln Ser Glu Tyr Lys Gln Ile Pro Leu Pro Phe Ile Val Val
545 550 555 560

Ile Val Asp Glu Leu Ala Asp Leu Met Met Val Ala Ser Lys Glu Val
565 570 575

Glu Asp Ala Ile Ile Arg Leu Gly Gln Lys Ala Arg Ala Ala Gly Ile
580 585 590

00769757 013604

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	JJ	JK	JL	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF	KG	KH	KI	KJ	KK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LL	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	<th>TW</th> <th>TX</th> <th>TY</th> <th>TZ</th> <th>UA</th> <th>UB</th> <th>UC</th> <th>UD</th> <th>UE</th> <th>UF</th> <th>UG</th> <th>UH</th> <th>UI</th> <th>UJ</th> <th>UK</th> <th>UL</th> <th>UM</th> <th>UN</th> <th>UO</th> <th>UP</th> <th>UQ</th> <th>UR</th> <th>US</th> <th>UT</th> <th>UU</th> <th>UV</th> <th>UW</th> <th>UX</th> <th>UY</th> <th>UZ</th> <th>VA</th> <th>VB</th> <th>VC</th> <th>VD</th> <th>VE</th> <th>VF</th> <th>VG</th> <th>VH</th> <th>VI</th> <th>VJ</th> <th>VK</th> <th>VL</th> <th>VM</th> <th>VN</th> <th>VO</th> <th>VP</th> <th>VQ</th> <th>VR</th> <th>VS</th> <th>VT</th> <th>VU</th> <th>VV</th> <th>VW</th> <th>VX</th> <th>VY</th> <th>VZ</th> <th>WA</th> <th>WB</th> <th>WC</th> <th>WD</th> <th>WE</th> <th>WF</th> <th>WG</th> <th>WH</th> <th>WI</th> <th>WJ</th> <th>WK</th> <th>WL</th> <th>WM</th> <th>WN</th> <th>WO</th> <th>WP</th> <th>WQ</th> <th>WR</th> <th>WS</th> <th>WT</th> <th>WU</th> <th>WV</th> <th>WW</th> <th>WX</th> <th>WY</th> <th>WZ</th> <th>XA</th> <th>XB</th> <th>XC</th> <th>XD</th> <th>XE</th> <th>XF</th> <th>YG</th> <th>YH</th> <th>YI</th> <th>YJ</th> <th>YK</th> <th>YL</th> <th>YM</th> <th>YN</th> <th>YO</th> <th>YP</th> <th>YQ</th> <th>YR</th> <th>YS</th> <th>YT</th> <th>YU</th> <th>YV</th> <th>YW</th> <th>YX</th> <th>YY</th> <th>YZ</th> <th>ZA</th> <th>ZB</th> <th>ZC</th> <th>ZD</th> <th>ZE</th> <th>ZF</th> <th>ZG</th> <th>ZH</th> <th>ZI</th> <th>ZJ</th> <th>ZK</th> <th>ZL</th> <th>ZM</th> <th>ZN</th> <th>ZO</th> <th>ZP</th> <th>ZQ</th> <th>ZR</th> <th>ZS</th> <th>ZT</th> <th>ZU</th> <th>ZV</th> <th>ZW</th> <th>ZX</th> <th>ZY</th> <th>ZZ</th> <th>AA</th> <th>AB</th> <th>AC</th> <	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC
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Ile Gly Pro Ala Glu Gly Thr Lys Pro Arg Lys Val Leu Gln Gln
755 760 765

<210> 97

<211> 175

<212> PRT

<213> Streptococcus pneumoniae

<400> 97

Met Ser Tyr Phe Lys Lys Tyr Lys Phe Asp Lys Ser Gln Phe Lys Leu

1

5

10

15

Gly Met Arg Thr Phe Lys Thr Gly Ile Ala Val Phe Leu Val Leu Leu

20

25

30

Ile Phe Gly Phe Phe Gly Trp Lys Gly Leu Gln Ile Gly Ala Leu Thr

35

40

45

Ala Val Phe Ser Leu Arg Glu Ser Phe Asp Glu Ser Val His Phe Gly

50

55

60

Thr Ser Arg Ile Leu Gly Asn Ser Ile Gly Gly Leu Tyr Ala Leu Val

65

70

75

80

Phe Phe Leu Leu Asn Thr Phe Phe His Glu Ala Phe Trp Val Thr Leu

85

90

95

Val Val Val Pro Ile Cys Thr Met Leu Thr Ile Met Thr Asn Val Ala

100

105

110

Met Asn Asn Lys Ala Gly Val Ile Gly Gly Val Ala Ala Met Leu Ile

115

120

125

Ile Thr Leu Ser Ile Pro Ser Gly Glu Thr Ile Leu Tyr Val Phe Val

130

135

140

Arg Val Leu Glu Thr Phe Met Gly Val Phe Val Ala Ile Ile Val Asn

145

150

155

160

Tyr Asp Ile Asp Arg Ile Arg Leu Phe Leu Glu Lys Lys Glu Lys

165

170

175

00959787 013501

<210> 98

<211> 156

<212> PRT

<213> Streptococcus pneumoniae

<400> 98

Met Asn Lys Ser Glu His Arg His Gln Leu Ile Arg Ala Leu Ile Thr
 1 5 10 15

Lys Asn Lys Ile His Thr Gln Ala Glu Leu Gln Ala Leu Leu Ala Glu
 20 25 30

Asn Asp Ile Gln Val Thr Gln Ala Thr Leu Ser Arg Asp Ile Lys Asn
 35 40 45

Met Asn Leu Ser Lys Val Arg Glu Glu Asp Ser Ala Tyr Tyr Val Leu
 50 55 60

Asn Asn Gly Ser Ile Ser Lys Trp Glu Lys Arg Leu Glu Leu Tyr Met
 65 70 75 80

Glu Asp Ala Leu Val Trp Met Arg Pro Val Gln His Gln Val Leu Leu
 85 90 95

Lys Thr Leu Pro Gly Leu Ala Gln Ser Phe Gly Ser Ile Ile Asp Thr
 100 105 110

Leu Ser Phe Pro Asp Ala Ile Ala Thr Leu Cys Gly Asn Asp Val Cys
 115 120 125

Leu Ile Ile Cys Glu Asp Ala Asp Thr Ala Gln Lys Cys Phe Glu Glu
 130 135 140

Leu Lys Lys Phe Ala Pro Pro Phe Phe Phe Glu Glu
 145 150 155

009697 013601
 109210 2526260

<210> 99

<211> 495

<212> PRT

<213> Streptococcus pneumoniae

<400> 99

Met Lys Ser Ile Lys Leu Asn Ala Leu Ser Tyr Met Gly Ile Arg Val

1

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10

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Leu Asn Ile Ile Phe Pro Ile Leu Thr Gly Thr Tyr Val Ala Arg Val

20

25

30

Leu Asp Arg Thr Asp Tyr Gly Tyr Phe Asn Ser Val Asp Thr Ile Leu

35

40

45

Ser Phe Phe Leu Pro Phe Ala Thr Tyr Gly Val Tyr Asn Tyr Gly Leu

50

55

60

Arg Ala Ile Ser Asn Val Lys Asp Asn Lys Lys Asp Leu Asn Arg Thr

65

70

75

80

Phe Ser Ser Leu Phe Tyr Leu Cys Ile Ala Cys Thr Ile Leu Thr Thr

85

90

95

Ala Val Tyr Ile Leu Ala Tyr Pro Leu Phe Phe Thr Asp Asn Pro Ile

100

105

110

Val Lys Lys Val Tyr Leu Val Met Gly Ile Gln Leu Ile Ala Gln Ile

115

120

125

Phe Ser Ile Glu Trp Val Asn Glu Ala Leu Glu Asn Tyr Ser Phe Leu

130

135

140

Phe Tyr Lys Thr Ala Phe Ile Arg Ile Leu Met Leu Val Ser Ile Phe

145

150

155

160

Leu Phe Val Lys Asn Glu His Asp Ile Val Val Tyr Thr Leu Val Met

165

170

175

005670-01604

219

Ser Leu Ser Thr Leu Ile Asn Tyr Leu Ile Ser Tyr Phe Trp Ile Lys
180 185 190

Arg Asp Ile Lys Leu Val Lys Ile His Leu Ser Asp Phe Lys Pro Leu
195 200 205

Phe Leu Pro Leu Thr Ala Met Leu Val Phe Ala Asn Ala Asn Met Leu
210 215 220

Phe Thr Phe Leu Asp Arg Leu Phe Leu Val Lys Thr Gly Ile Asp Val
225 230 235 240

Asn Val Ser Tyr Tyr Thr Ile Ala Gln Arg Ile Val Thr Val Ile Ala
245 250 255

Gly Val Val Thr Gly Ala Ile Gly Val Ser Val Pro Arg Leu Ser Tyr
260 265 270

Tyr Leu Gly Lys Gly Asp Lys Glu Ala Tyr Val Ser Leu Val Asn Arg
275 280 285

Gly Ser Arg Ile Phe Asn Phe Phe Ile Ile Pro Leu Ser Phe Gly Leu
290 295 300

Met Val Leu Gly Pro Asn Ala Ile Leu Leu Tyr Gly Ser Glu Lys Tyr
305 310 315 320

Ile Gly Gly Gly Ile Leu Thr Ser Leu Phe Ala Phe Arg Thr Ile Ile
325 330 335

Leu Ala Leu Asp Thr Ile Leu Gly Ser Gln Ile Leu Phe Thr Asn Gly
340 345 350

Tyr Glu Lys Arg Ile Thr Val Tyr Thr Val Phe Ala Gly Leu Leu Asn
355 360 365

Leu Gly Leu Asn Ser Leu Leu Phe Phe Asn His Ile Val Ala Pro Glu
370 375 380

0056739-045604

[illegible]

Glu Asn Val Asp Gln Glu Leu Leu Leu Gly Asp Ile Ala Asp Ile Ser
35 40 45

221

Gly Cys Arg Asn Pro Ala Val Phe Met Glu Arg Tyr Phe Gln Ile Asp
50 55 60

Asp Ala His Leu Ser Lys Glu Phe Gln Lys Phe Pro Ser Phe Ser Ile
65 70 75 80

Leu Asp Asp Cys Tyr Pro Trp Asp Leu Ser Glu Ile Tyr Asp Ala Pro
85 90 95

Val Leu Leu Phe Tyr Lys Gly Asn Leu Asp Leu Leu Lys Phe Pro Lys
100 105 110

Val Ala Val Val Gly Ser Arg Ala Cys Ser Lys Gln Gly Ala Lys Ser
115 120 125

Val Glu Lys Val Ile Gln Gly Leu Glu Asn Glu Leu Val Ile Val Ser
130 135 140

Gly Leu Ala Lys Gly Ile Asp Thr Ala Ala His Met Ala Ala Leu Gln
145 150 155 160

Asn Gly Gly Lys Thr Ile Ala Val Ile Gly Thr Gly Leu Asp Val Phe
165 170 175

Tyr Pro Lys Ala Asn Lys Arg Leu Gln Asp Tyr Ile Gly Asn Asp His
180 185 190

Leu Val Leu Ser Glu Tyr Gly Pro Gly Glu Gln Pro Leu Lys Phe His
195 200 205

Phe Pro Ala Arg Asn Arg Ile Ile Ala Gly Leu Cys Arg Gly Val Ile
210 215 220

Val Ala Glu Ala Lys Met Arg Ser Gly Ser Leu Ile Thr Cys Glu Arg
225 230 235 240

Ala Met Glu Glu Gly Arg Asp Val Phe Ala Ile Pro Gly Ser Ile Leu
245 250 255

007697 01504
10510 26260

222

Asp Gly Leu Ser Asp Gly Cys His His Leu Ile Gln Glu Gly Ala Lys
260 265 270

Leu Val Thr Ser Gly Gln Asp Val Leu Ala Glu Phe Glu Phe
275 280 285

<210> 101

<211> 267

<212> PRT

<213> Streptococcus pneumoniae

<400> 101

Met Lys Gln Leu Thr Val Glu Asp Ala Lys Gln Ile Glu Leu Glu Ile
1 5 10 15

Leu Asp Tyr Ile Asp Thr Leu Cys Lys Lys His Asn Ile Asn Tyr Ile
20 25 30

Ile Asn Tyr Gly Thr Leu Ile Gly Ala Val Arg His Glu Gly Phe Ile
35 40 45

Pro Trp Asp Asp Asp Ile Asp Leu Ser Met Pro Arg Glu Asp Tyr Gln
50 55 60

Arg Phe Ile Asn Ile Phe Gln Lys Glu Lys Ser Lys Tyr Lys Leu Leu
65 70 75 80

Ser Leu Glu Thr Asp Lys Asn Tyr Phe Asn Asn Phe Ile Lys Ile Thr
85 90 95

Asp Ser Thr Thr Lys Ile Ile Asp Thr Arg Asn Thr Lys Thr Tyr Glu
100 105 110

Ser Gly Ile Phe Ile Asp Ile Phe Pro Ile Asp Arg Phe Asp Asp Pro
115 120 125

223

Lys Val Ile Asp Thr Cys Tyr Lys Leu Glu Ser Phe Lys Leu Leu Ser
130 135 140

Phe Ser Lys His Lys Asn Ile Val Tyr Lys Asp Ser Leu Leu Lys Asp
145 150 155 160

Trp Ile Arg Thr Ala Phe Trp Leu Leu Leu Arg Pro Val Ser Pro Arg
165 170 175

Tyr Phe Ala Asn Lys Ile Glu Lys Glu Ile Gln Lys Tyr Ser Arg Glu
180 185 190

Asn Gly Gln Tyr Met Ala Phe Ile Pro Ser Lys Phe Lys Glu Lys Glu
195 200 205

Val Phe Pro Ser Gly Thr Phe Asp Lys Thr Ile Asp Leu Pro Phe Glu
210 215 220

Asn Leu Ser Leu Pro Ala Pro Glu Lys Phe Asp Thr Ile Leu Thr Gln
225 230 235 240

Phe Tyr Gly Asp Tyr Met Thr Leu Pro Pro Glu Glu Lys Arg Phe Tyr
245 250 255

Ser His Glu Phe His Ala Tyr Lys Leu Glu Asp
260 265

<210> 102

<211> 508

<212> PRT

<213> Streptococcus pneumoniae

<400> 102

Met Ile Lys Ile Asn His Leu Thr Ile Thr Gln Asn Lys Asp Leu Arg
1 5 10 15

00769701012604

[illegible]

Ala Ile Ile Gly Glu Glu Gly Asn Gly Lys Ser Thr Leu Leu Lys Ile
35 40 45

Leu Met Gly Glu Ala Leu Ser Asp Phe Thr Ile Lys Gly Asn Ile Gln
50 55 60

Ser Asp Tyr Gln Ser Leu Ala Tyr Ile Pro Gln Lys Val Pro Glu Asp
65 70 75 80

Leu Lys Lys Lys Thr Leu His Asp Tyr Phe Phe Leu Asp Ser Ile Asp
85 90 95

Leu Asp Tyr Ser Ile Leu Tyr Arg Leu Ala Glu Glu Leu His Phe Asp
100 105 110

Ser Asn Arg Phe Ala Ser Asp Gln Glu Ile Gly Asn Leu Ser Gly Gly
115 120 125

Glu Ala Leu Lys Ile Gln Leu Ile His Glu Leu Ala Lys Pro Phe Glu
130 135 140

Ile Leu Phe Leu Asp Glu Pro Ser Asn Asp Leu Asp Leu Glu Thr Val
145 150 155 160

Asp Trp Leu Lys Gly Gln Ile Gln Lys Thr Arg Gln Thr Val Ile Phe
165 170 175

Ile Ser His Asp Glu Asp Phe Leu Ser Glu Thr Ala Asp Thr Ile Val
180 185 190

His Leu Arg Leu Val Lys His Arg Lys Glu Ala Glu Thr Leu Val Glu
195 200 205

His Leu Asp Tyr Asp Ser Tyr Ser Glu Gln Arg Lys Ala Asn Phe Ala
210 215 220

225

Lys Gln Ser Gln Gln Ala Ala Asn Asn Gln Arg Ala Tyr Asp Lys Thr
225 230 235 240

Met Glu Lys His Arg Arg Val Lys Gln Asn Val Glu Thr Ala Leu Arg
245 250 255

Ala Thr Lys Asp Ser Thr Ala Gly Arg Leu Leu Ala Lys Lys Met Lys
260 265 270

Thr Val Leu Ser Gln Glu Lys Arg Tyr Glu Lys Ala Ala Gln Ser Met
275 280 285

Thr Gln Lys Pro Leu Glu Glu Glu Gln Ile Gln Leu Phe Phe Ser Asp
290 295 300

Ile Gln Pro Leu Pro Ala Ser Lys Val Leu Val Gln Leu Glu Lys Glu
305 310 315 320

Asn Leu Ser Ile Asp Asp Arg Val Leu Val Gln Lys Leu Gln Leu Thr
325 330 335

Val Arg Gly Gln Glu Lys Ile Gly Ile Ile Gly Pro Asn Gly Val Gly
340 345 350

Lys Ser Thr Leu Leu Ala Lys Leu Gln Arg Leu Leu Asn Asp Lys Arg
355 360 365

Glu Ile Ser Leu Gly Phe Met Pro Gln Asp Tyr His Lys Lys Leu Gln
370 375 380

Leu Asp Leu Ser Pro Ile Ala Tyr Leu Ser Lys Thr Gly Glu Lys Glu
385 390 395 400

Glu Leu Gln Lys Ile Gln Ser His Leu Ala Ser Leu Asn Phe Ser Tyr
405 410 415

Pro Glu Met Gln His Gln Ile Arg Ser Leu Ser Gly Gly Gln Gln Gly
420 425 430

00369739 03269260

226

Lys Leu Leu Leu Leu Asp Leu Val Leu Arg Lys Pro Asn Phe Leu Leu
435 440 445

Leu Asp Glu Pro Thr Arg Asn Phe Ser Pro Thr Ser Gln Pro Gln Ile
450 455 460

Arg Lys Leu Phe Ala Thr Tyr Pro Gly Gly Leu Ile Thr Val Ser His
465 470 475 480

Asp Arg Arg Phe Leu Lys Glu Val Cys Ser Ile Ile Tyr Arg Met Thr
485 490 495

Glu His Gly Leu Lys Leu Val Asn Leu Glu Asp Leu
500 505

<210> 103

<211> 237

<212> PRT

<213> Streptococcus pneumoniae

<400> 103

Met Lys Pro Lys Thr Phe Tyr Asn Leu Leu Ala Glu Gln Asn Leu Pro
1 5 10 15

Leu Ser Asp Gln Gln Lys Glu Gln Phe Glu Arg Tyr Phe Glu Leu Leu
20 25 30

Val Glu Trp Asn Glu Lys Ile Asn Leu Thr Ala Ile Thr Asp Lys Glu
35 40 45

Glu Val Tyr Leu Lys His Phe Tyr Asp Ser Ile Ala Pro Ile Leu Gln
50 55 60

Gly Leu Ile Pro Asn Glu Thr Ile Lys Leu Leu Asp Ile Gly Ala Gly
65 70 75 80

005210 237 237 237

227

Ala Gly Phe Pro Ser Leu Pro Met Lys Ile Leu Tyr Pro Glu Leu Asp
85 90 95

Val Thr Ile Ile Asp Ser Leu Asn Lys Arg Ile Asn Phe Leu Gln Leu
100 105 110

Leu Ala Gln Glu Leu Asp Leu Asn Gly Val His Phe Tyr His Gly Arg
115 120 125

Ala Glu Asp Phe Ala Gln Asp Lys Asn Phe Arg Ala Gln Tyr Asp Phe
130 135 140

Val Thr Ala Arg Ala Val Ala Arg Met Gln Val Leu Ser Glu Leu Thr
145 150 155 160

Ile Pro Tyr Leu Lys Val Gly Gly Lys Leu Leu Ala Leu Lys Ala Ser
165 170 175

Asn Ala Pro Glu Glu Leu Leu Glu Ala Lys Asn Ala Leu Asn Leu Leu
180 185 190

Phe Ser Lys Val Glu Asp Asn Leu Ser Tyr Ala Leu Pro Asn Arg Asp
195 200 205

Pro Arg Tyr Ile Thr Val Val Glu Lys Lys Lys Glu Thr Pro Asn Lys
210 215 220

Tyr Pro Arg Lys Ala Gly Met Pro Asn Lys Arg Pro Leu
225 230 235

<210> 104

<211> 268

<212> PRT

<213> Streptococcus pneumoniae

<400> 104

Met Ser Ile Lys Leu Ile Ala Val Asp Ile Asp Gly Thr Leu Val Asn
1 5 10 15

228

Ser Gln Lys Glu Ile Thr Pro Glu Val Phe Ser Ala Ile Gln Asp Ala
20 25 30

Lys Glu Ala Gly Val Lys Val Val Ile Ala Thr Gly Arg Pro Ile Ala
35 40 45

Gly Val Ala Lys Leu Leu Asp Asp Leu Gln Leu Arg Asp Glu Gly Asp
50 55 60

Tyr Val Val Thr Phe Asn Gly Ala Leu Val Gln Glu Thr Ala Thr Gly
65 70 75 80

His Glu Ile Ile Ser Glu Ser Leu Thr Tyr Glu Asp Tyr Leu Asp Met
85 90 95

Glu Phe Leu Ser Arg Lys Leu Gly Val His Met His Ala Ile Thr Lys
100 105 110

Asp Gly Ile Tyr Thr Ala Asn Arg Asn Ile Gly Lys Tyr Thr Val His
115 120 125

Glu Ser Thr Leu Val Ser Met Pro Ile Phe Tyr Arg Thr Pro Glu Glu
130 135 140

Met Ala Gly Lys Glu Ile Val Lys Cys Met Phe Ile Asp Glu Pro Glu
145 150 155 160

Ile Leu Asp Ala Ala Ile Glu Lys Ile Pro Ala Glu Phe Tyr Glu Arg
165 170 175

Tyr Ser Ile Asn Lys Ser Ala Pro Phe Tyr Leu Glu Leu Leu Lys Lys
180 185 190

Asn Val Asp Lys Gly Ser Ala Ile Thr His Leu Ala Glu Lys Leu Gly
195 200 205

Leu Thr Lys Asp Glu Thr Met Ala Ile Gly Asp Glu Glu Asn Asp Arg
210 215 220

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[illegible]

Ser Gly Ile Phe Ala Val Ala Glu Ser Tyr Pro Asp Leu Lys Ala Ser
100 105 110

230

Ala Asn Phe Val Lys Leu Gln Glu Glu Leu Thr Asn Thr Glu Asn Lys
115 120 125

Ile Ser Tyr Ser Arg Gln Leu Tyr Asn Ser Val Val Ser Asn Tyr Asn
130 135 140

Val Lys Leu Glu Thr Phe Pro Ser Asn Ile Ile Ala Gly Met Phe Gly
145 150 155 160

Phe Lys Ala Ala Asp Phe Leu Gln Thr Pro Glu Glu Glu Lys Ser Val
165 170 175

Pro Lys Val Asp Phe Ser Gly Leu Gly Asp
180 185

<210> 106

<211> 299

<212> PRT

<213> Streptococcus pneumoniae

<400> 106

Met Leu Phe Asp Gln Ile Ala Ser Asn Lys Arg Lys Thr Trp Ile Leu
1 5 10 15

Leu Leu Val Phe Phe Leu Leu Leu Ala Leu Val Gly Tyr Ala Val Gly
20 25 30

Tyr Leu Phe Ile Arg Ser Gly Leu Gly Gly Leu Val Ile Ala Leu Ile
35 40 45

Ile Gly Phe Ile Tyr Ala Leu Ser Met Ile Phe Gln Ser Thr Glu Ile
50 55 60

Val Met Ser Met Asn Gly Ala Arg Glu Val Asp Glu Gln Thr Ala Pro
65 70 75 80

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[illegible]

Pro Lys Lys Gly Gly Gly Phe Gln Lys Leu Phe Tyr Thr His Pro Pro
275 280 285

232

Ile Ser Glu Arg Ile Glu Arg Leu Lys Gln Met

290

295

<210> 107

<211> 180

<212> PRT

<213> Streptococcus pneumoniae

<400> 107

Met Lys Leu Asn Ile Gln Glu Ile Arg Lys Gln Ser Glu Gly Leu Asn

1

5

10

15

Phe Glu Gln Thr Leu Asp Leu Val Asp Asp Leu Arg Ala Arg Asn Gln

20

25

30

Glu Ile Leu Asp Val Lys Asp Ile Leu Ala Val Gly Lys Val Gln Tyr

35

40

45

Glu Asp Arg Met Tyr Phe Leu Asp Tyr Gln Leu Ser Tyr Thr Ile Val

50

55

60

Leu Ala Ser Ser Arg Ser Met Glu Pro Val Glu Leu Val Glu Ser Tyr

65

70

75

80

Pro Val Thr Glu Val Phe Met Glu Gly Ala Thr Asn Gln Leu Asp Gln

85

90

95

Glu Val Leu Asp Asp Asp Leu Val Leu Pro Ile Glu Asn Gly Glu Leu

100

105

110

Asp Leu Ala Glu Ser Val Ser Asp Asn Ile Leu Leu Asn Ile Pro Ile

115

120

125

Lys Val Leu Thr Ala Glu Glu Glu Ala Gly Gln Gly Phe Ile Ser Gly

130

135

140

09269797 045604

233

Asn Asp Trp Gln Ile Met Thr Glu Glu Glu Tyr Gln Ala Gln Lys Ala
145 150 155 160

Val Lys Lys Glu Glu Asn Ser Pro Phe Ala Gly Leu Gln Gly Leu Phe
165 170 175

Asp Gly Asp Glu
180

<210> 108

<211> 177

<212> PRT

<213> Streptococcus pneumoniae

<400> 108

Met Lys Arg Gln Leu Ala Leu Val Val Phe Ser Gly Gly Gln Asp Ser
1 5 10 15

Thr Thr Cys Leu Phe Trp Val Met Gln His Tyr Glu Thr Val Glu Ala
20 25 30

Val Thr Phe Ala Tyr Gly Gln Arg His His Leu Glu Ile Gln Ile Thr
35 40 45

Arg Glu Ile Ala Lys Glu Gln Gly Ile Arg His His Ile Leu Asp Met
50 55 60

Ser Leu Leu Gly Gln Ile Thr Ala Gln Pro Asp Phe Ala Thr Ile His
65 70 75 80

Ile Ser Tyr Ile Pro Asp Lys Leu Cys Val Glu Ser Lys Ser Leu Lys
85 90 95

Leu Tyr Leu Phe Ser Tyr Arg Asn His Gly Asp Phe His Glu Asn Cys
100 105 110

09769797 045604

234

Ile Asn Thr Ile Gly Lys Asp Leu Val Asn Leu Leu Asp Pro Arg Tyr
115 120 125

Leu Glu Val Trp Gly Lys Phe Thr Pro Arg Gly Gly Ile Ser Ile Asp
130 135 140

Pro Tyr Tyr Asn Tyr Gly Lys Gln Gly Thr Lys Tyr Glu Gly Leu Ala
145 150 155 160

Glu Gln Arg Leu Phe Gln His Asp Leu Tyr Pro Glu Lys Ile Asp Asn
165 170 175

Arg

<210> 109

<211> 1236

<212> PRT

<213> Streptococcus pneumoniae

<400> 109

Met Thr Glu Thr Val Glu Asp Lys Val Ser His Ser Ile Thr Gly Leu
1 5 10 15

Asp Ile Leu Lys Gly Ile Val Ala Ala Gly Ala Val Ile Ser Gly Thr
20 25 30

Val Ala Thr Gln Thr Lys Val Phe Thr Asn Glu Ser Ala Val Leu Glu
35 40 45

Lys Thr Val Glu Lys Thr Asp Ala Leu Ala Thr Asn Asp Thr Val Val
50 55 60

Leu Gly Thr Ile Ser Thr Ser Asn Ser Ala Ser Ser Thr Ser Leu Ser
65 70 75 80

09769787 045604

235

Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser
85 90 95

Ala Ser Thr Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser
100 105 110

Ala Ser Thr Ser Ile Ser Ala Ser Ser Thr Val Val Gly Ser Gln Thr
115 120 125

Ala Ala Ala Thr Glu Ala Thr Ala Lys Lys Val Glu Glu Asp Arg Lys
130 135 140

Lys Pro Ala Ser Asp Tyr Val Ala Ser Val Thr Asn Val Asn Leu Gln
145 150 155 160

Ser Tyr Ala Lys Arg Arg Lys Arg Ser Val Asp Ser Ile Glu Gln Leu
165 170 175

Leu Ala Ser Ile Lys Asn Ala Ala Val Phe Ser Gly Asn Thr Ile Val
180 185 190

Asn Gly Ala Pro Ala Ile Asn Ala Ser Leu Asn Ile Ala Lys Ser Glu
195 200 205

Thr Lys Val Tyr Thr Gly Glu Gly Val Asp Ser Val Tyr Arg Val Pro
210 215 220

Ile Tyr Tyr Lys Leu Lys Val Thr Asn Asp Gly Ser Lys Leu Thr Phe
225 230 235 240

Thr Tyr Thr Val Thr Tyr Val Asn Pro Lys Thr Asn Asp Leu Gly Asn
245 250 255

Ile Ser Ser Met Arg Pro Gly Tyr Ser Ile Tyr Asn Ser Gly Thr Ser
260 265 270

Thr Gln Thr Met Leu Thr Leu Gly Ser Asp Leu Gly Lys Pro Ser Gly
275 280 285

09769707 04504

236

Val Lys Asn Tyr Ile Thr Asp Lys Asn Gly Arg Gln Val Leu Ser Tyr
290 295 300

Asn Thr Ser Thr Met Thr Thr Gln Gly Ser Gly Tyr Thr Trp Gly Asn
305 310 315 320

Gly Ala Gln Met Asn Gly Phe Phe Ala Lys Lys Gly Tyr Gly Leu Thr
325 330 335

Ser Ser Trp Thr Val Pro Ile Thr Gly Thr Asp Thr Ser Phe Thr Phe
340 345 350

Thr Pro Tyr Ala Ala Arg Thr Asp Arg Ile Gly Ile Asn Tyr Phe Asn
355 360 365

Gly Gly Gly Lys Val Val Glu Ser Ser Thr Thr Ser Gln Ser Leu Ser
370 375 380

Gln Ser Lys Ser Leu Ser Val Ser Ala Ser Gln Ser Ala Ser Ala Ser
385 390 395 400

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser
405 410 415

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Val Ser
420 425 430

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser
435 440 445

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Ala Ser
450 455 460

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser
465 470 475 480

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Ala Ser
485 490 495

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237

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Ala Ser
500 505 510

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Gly Ser
515 520 525

Ala Ser Thr Ser Thr Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser
530 535 540

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Ile Ser Ala Ser Glu Ser
545 550 555 560

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Thr Ser Ala Ser
565 570 575

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Ala Ser
580 585 590

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser
595 600 605

Ala Ser Thr Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser
610 615 620

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser
625 630 635 640

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser
645 650 655

Thr Ser Ala Ser Val Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser
660 665 670

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser
675 680 685

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser
690 695 700

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238

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser
705 710 715 720

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser
725 730 735

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser
740 745 750

Thr Ser Ala Ser Gly Ser Ala Ser Thr Ser Thr Ser Ala Ser Ala Ser
755 760 765

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser
770 775 780

Ile Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser
785 790 795 800

Thr Ser Thr Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser
805 810 815

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser
820 825 830

Thr Ser Ala Ser Ala Ser Ala Arg Gln Val Arg Arg Pro Gln Pro Val
835 840 845

His Leu Asn Arg His Gln Pro Val Arg Gln Pro Gln Gln Val Leu Val
850 855 860

His Gln Leu Gln His Gln Arg Val His Arg Leu Gln His Gln Pro Val
865 870 875 880

Pro Arg Leu Gln Arg Gln Pro Val Arg Gln Leu Gln Gln Val Pro Val
885 890 895

Leu Gln Ser Gln His Gln Gln Val Leu Gln Pro Gln His Arg Gln Val
900 905 910

09769787 043604

Arg Leu Ser Gln His Gln Arg Val Arg Gln Pro Gln Gln Ala His Gln
1105 1110 1115 1120

[illegible]

Gly Gly Gly Phe Leu Leu Ile Phe Leu Ile Ser Thr Ile Leu Ile Gly
35 40 45

241

Phe Pro Leu Leu Leu Ala Glu Phe Ala Leu Gly Arg Ser Ala Gly Val
50 55 60

Ser Ala Ile Lys Thr Phe Gly Lys Leu Gly Lys Asn Asn Lys Tyr Asn
65 70 75 80

Phe Ile Gly Trp Ile Gly Ala Phe Ala Leu Phe Ile Leu Leu Ser Phe
85 90 95

Tyr Ser Val Ile Gly Gly Trp Ile Leu Val Tyr Leu Gly Ile Glu Phe
100 105 110

Gly Lys Leu Phe Gln Leu Gly Gly Thr Gly Asp Tyr Ala Gln Leu Phe
115 120 125

Thr Ser Ile Ile Ser Asn Pro Ala Ile Ala Leu Gly Ala Gln Ala Ala
130 135 140

Phe Ile Leu Leu Asn Ile Phe Ile Val Ser Arg Gly Val Gln Lys Gly
145 150 155 160

Ile Glu Arg Ala Ser Lys Val Met Met Pro Leu Leu Phe Ile Val Phe
165 170 175

Val Phe Ile Ile Gly Arg Ser Leu Ser Leu Pro Asn Ala Met Glu Gly
180 185 190

Val Leu Tyr Phe Leu Lys Pro Asp Phe Ser Lys Leu Thr Ser Thr Gly
195 200 205

Leu Leu Tyr Ala Leu Gly Gln Ser Phe Phe Ala Leu Ser Leu Gly Val
210 215 220

Thr Val Met Leu Thr Tyr Ala Ser Tyr Leu Asp Lys Lys Thr Asn Leu
225 230 235 240

Val Gln Ser Gly Ile Ser Ile Val Ala Met Asn Ile Ser Ile Ser Ile
245 250 255

105270-1846260

242

Met Ala Gly Leu Ala Ile Phe Gln Ala Arg Ser Pro Phe Asn Ile Gln
260 265 270

Ser Glu Gly Gly Pro Ser Leu Leu Phe Ile Val Leu Pro Gln Leu Phe
275 280 285

Asp Lys Met Pro Phe Gly Thr Ile Phe Tyr Val Leu Phe Leu Leu Leu
290 295 300

Phe Leu Phe Ala Thr Val Thr Phe Ser Val Val Met Leu Glu Ile Asn
305 310 315 320

Val Asp Asn Ile Thr Asn Gln Asp Asn Ser Lys Arg Ala Lys Trp Ser
325 330 335

Val Ile Leu Gly Ile Leu Thr Phe Val Phe Gly Ile Pro Ser Ala Leu
340 345 350

Ser Tyr Gly Val Met Ala Asp Val His Ile Phe Gly Lys Thr Phe Phe
355 360 365

Asp Ala Met Asp Phe Leu Val Ser Asn Leu Leu Met Pro Phe Gly Ala
370 375 380

Leu Tyr Leu Ser Leu Phe Thr Gly Tyr Ile Phe Lys Lys Ala Leu Ala
385 390 395 400

Met Glu Glu Leu His Leu Asp Glu Arg Ala Trp Lys Gln Gly Leu Phe
405 410 415

Gln Val Trp Leu Phe Leu Leu Arg Phe Phe Val Ser Ser Phe Gln Ser
420 425 430

Ser Ser Leu Trp Ser Ser Leu Pro Asn Leu Cys Asn Gln Lys Gly Leu
435 440 445

Glu

00360397 013501

<210> 111

<211> 186

<212> PRT

<213> Streptococcus pneumoniae

<400> 111

Met Leu Lys Lys Trp Gln Leu Lys Asp Val Ile Leu Leu Ala Phe Leu

1

5

10

15

Ser Ile Phe Phe Gly Gly Val Phe Val Gly Ser Gly Tyr Val Tyr Asn

20

25

30

Ile Leu Ser Leu Leu Leu Thr Pro Leu Gly Leu Gln Ala Phe Ala Asn

35

40

45

Glu Ile Leu Phe Gly Leu Trp Cys Met Ala Ala Pro Ile Ala Ala Ile

50

55

60

Phe Val Pro Arg Val Gly Ser Ala Thr Ile Gly Glu Val Leu Ala Ala

65

70

75

80

Leu Ala Glu Val Leu Tyr Gly Ser Gln Phe Gly Leu Gly Ala Leu Leu

85

90

95

Ser Gly Phe Val Gln Gly Leu Gly Ser Glu Phe Gly Phe Ile Val Thr

100

105

110

Lys Asn Arg Tyr Glu Ser Trp Leu Ser Leu Thr Ala Asn Ser Ile Gly

115

120

125

Ile Thr Leu Val Ser Phe Val Tyr Glu Tyr Ile Lys Leu Gly Tyr Tyr

130

135

140

Ala Phe Ser Leu Pro Phe Val Leu Ser Leu Leu Val Val Arg Phe Ile

145

150

155

160

Ser Val Tyr Phe Phe Cys Thr Ile Leu Val Arg Ala Ile Val Lys Leu

165

170

175

105697-01604

244

Tyr His Gln Phe Ala Thr Gly Gly Lys Ala

180

185

<210> 112

<211> 216

<212> PRT

<213> Streptococcus pneumoniae

<400> 112

Met Val Lys Val Ala Thr Gln Thr Pro Ile Ile Ser Leu Phe Leu Leu

1

5

10

15

Ile Leu Ser Leu Glu Thr Ser Phe Ile Pro Ser Ile Ala Leu Thr Leu

20

25

30

Ser Val Val Ala Phe Cys Ile Leu Phe Met Leu Tyr Tyr Arg Arg Phe

35

40

45

Lys Met Leu Ala Trp Met Ile Ile Leu Ala Ile Leu Pro Ser Phe Ala

50

55

60

Asn Tyr Trp Ala Val Gln Leu His Gly Asp Ala Ser Gln Ala Val Met

65

70

75

80

Leu Gly Thr Arg Ala Phe Val Thr Val Cys Ile Gly Leu Val Phe Val

85

90

95

Ser Ser Val Ser Leu Lys Glu Leu Leu Leu Tyr Leu Ala Gln Lys Gly

100

105

110

Leu Ser Arg Ser Trp Ser Tyr Ala Leu Ile Val Val Phe Asn Ser Phe

115

120

125

Pro Leu Ile Gln Gln Glu Ile Lys Ser Leu Lys Glu Ala Cys Leu Leu

130

135

140

003697.04664

245

Arg Gly Gln Glu Leu His Phe Trp Ser Pro Leu Ile Tyr Ser Lys Val
145 150 155 160

Leu Met Thr Val Phe Arg Trp Arg His Leu Tyr Leu Arg Ala Leu Ser
165 170 175

Ala His Gly Tyr Asp Glu His Ala Gln Leu Lys Asn Ser Tyr Arg Thr
180 185 190

Phe Tyr Ile Pro Lys Lys Thr Lys Leu Ile Tyr Leu Leu Phe Phe Leu
195 200 205

Leu Leu Gln Thr Ser Leu Phe Leu
210 215

<210> 113

<211> 174

<212> PRT

<213> Streptococcus pneumoniae

<400> 113

Met Arg Lys His Gln Leu Gln Val His Lys Leu Thr Ile Leu Ser Met
1 5 10 15

Met Ile Ala Leu Asp Val Val Leu Thr Pro Ile Phe Arg Ile Glu Gly
20 25 30

Met Ala Pro Met Ser Ser Val Val Asn Ile Leu Ala Gly Ile Met Met
35 40 45

Gly Pro Val Tyr Ala Leu Ala Met Ala Thr Val Thr Ala Phe Ile Arg
50 55 60

Met Thr Thr Gln Gly Ile Pro Pro Leu Ala Leu Thr Gly Ala Thr Phe
65 70 75 80

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[illegible]

Leu Asp Phe Thr Lys Gln Ser Gln Ala Leu Phe Ile Asn Leu Gly His
50 55 60

247

Leu Ser Ala Glu Lys Glu Lys Ala Ile Arg Met Ala Ala Ser Tyr Ala
65 70 75 80

Asn Gln Ser Ser Leu Pro Met Val Val Asp Ala Val Gly Val Thr Thr
85 90 95

Ser Ser Ile Arg Lys Ser Leu Val Lys Asp Leu Leu Asp Tyr Arg Pro
100 105 110

Thr Val Leu Lys Gly Asn Met Ser Glu Ile Arg Ser Leu Val Gly Leu
115 120 125

Lys His His Gly Val Gly Val Asp Ala Ser Ala Lys Asp Gln Glu Thr
130 135 140

Glu Asp Leu Leu Gln Val Leu Lys Asp Trp Cys Gln Thr Tyr Pro Gly
145 150 155 160

Met Ser Phe Leu Val Thr Gly Pro Lys Asp Leu Val Val Ser Lys Asn
165 170 175

Gln Val Ala Val Leu Gly Asn Gly Cys Thr Glu Leu Asp Trp Ile Thr
180 185 190

Gly Thr Gly Asp Leu Val Gly Ala Leu Thr Ala Val Phe Leu Ser Gln
195 200 205

Gly Lys Thr Gly Phe Glu Ala Ser Cys Leu Ala Val Ser Tyr Leu Asn
210 215 220

Ile Ala Ala Glu Lys Ile Val Val Gln Gly Met Gly Leu Glu Glu Phe
225 230 235 240

Arg Tyr Gln Val Leu Asn Gln Leu Ser Leu Leu Arg Arg Asp Glu Asn
245 250 255

Trp Leu Asp Thr Ile Lys Gly Glu Val Tyr Glu
260 265

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<210> 115

<211> 277

<212> PRT

<213> Streptococcus pneumoniae

<400> 115

Met Asn His Lys Ile Ala Ile Leu Ser Asp Val His Gly Asn Ala Thr
 1 5 10 15

Ala Leu Glu Ala Val Ile Ala Asp Ala Lys Asn Gln Gly Ala Ser Glu
 20 25 30

Tyr Trp Leu Leu Gly Asp Ile Phe Leu Pro Gly Pro Gly Ala Asn Asp
 35 40 45

Leu Val Ala Leu Leu Lys Asp Leu Pro Ile Thr Ala Ser Val Arg Gly
 50 55 60

Asn Trp Asp Asp Arg Val Leu Glu Ala Leu Asp Gly Gln Tyr Gly Leu
 65 70 75 80

Glu Asp Pro Gln Glu Val Gln Leu Leu Arg Met Thr Gln Tyr Leu Met
 85 90 95

Glu Arg Met Asp Pro Ala Thr Ile Val Trp Leu Arg Ser Leu Pro Leu
 100 105 110

Leu Glu Lys Lys Glu Ile Asp Gly Leu Arg Phe Ser Ile Ser His Asn
 115 120 125

Leu Pro Asp Lys Asn Tyr Gly Gly Asp Leu Leu Val Glu Asn Asp Thr
 130 135 140

Glu Lys Phe Asp Gln Leu Leu Asp Ala Glu Thr Asp Val Ala Val Tyr
 145 150 155 160

105210 2828260

249

Gly His Val His Lys Gln Leu Leu Arg Tyr Gly Ser Gln Gly Gln Gln
165 170 175

Ile Ile Asn Pro Gly Ser Ile Gly Met Pro Tyr Phe Asn Trp Glu Ala
180 185 190

Leu Lys Asn His Arg Ser Gln Tyr Ala Val Ile Glu Val Glu Asp Gly
195 200 205

Glu Leu Leu Asn Ile Gln Phe Arg Lys Val Ala Tyr Asp Tyr Glu Ala
210 215 220

Glu Leu Glu Leu Ala Lys Ser Lys Gly Leu Pro Phe Ile Glu Met Tyr
225 230 235 240

Glu Glu Leu Arg Arg Asp Asp Asn Tyr Gln Gly His Asn Leu Glu Leu
245 250 255

Leu Ala Ser Leu Ile Glu Lys His Gly Tyr Val Glu Asp Val Lys Asn
260 265 270

Phe Phe Asp Phe Leu
275

<210> 116

<211> 241

<212> PRT

<213> Streptococcus pneumoniae

<400> 116

Met Asn Val Asn Gln Ile Val Arg Ile Ile Pro Thr Leu Lys Ala Asn
1 5 10 15

Asn Arg Lys Leu Asn Glu Thr Phe Tyr Ile Glu Thr Leu Gly Met Lys
20 25 30

Ala Leu Leu Glu Glu Ser Ala Phe Leu Ser Leu Gly Asp Gln Thr Gly
35 40 45

109970289264

250

Leu Glu Lys Leu Val Leu Glu Glu Ala Pro Ser Met Arg Thr Arg Lys
50 55 60

Val Glu Gly Arg Lys Lys Leu Ala Arg Leu Ile Val Lys Val Glu Asn
65 70 75 80

Pro Leu Glu Ile Glu Gly Ile Leu Ser Lys Thr Asp Ser Ile His Arg
85 90 95

Leu Tyr Lys Gly Gln Asn Gly Tyr Ala Phe Glu Ile Phe Ser Pro Glu
100 105 110

Asp Asp Leu Ile Leu Ile His Ala Glu Asp Asp Ile Ala Ser Leu Val
115 120 125

Glu Val Gly Glu Lys Pro Glu Phe Gln Thr Asp Leu Ala Ser Ile Ser
130 135 140

Leu Ser Lys Phe Glu Ile Ser Met Glu Leu His Leu Pro Thr Asp Ile
145 150 155 160

Glu Ser Phe Leu Glu Ser Ser Glu Ile Gly Ala Ser Leu Asp Phe Ile
165 170 175

Pro Ala Gln Gly Gln Asp Leu Thr Val Asp Asn Thr Val Thr Trp Asp
180 185 190

Leu Ser Met Leu Lys Phe Leu Val Asn Glu Leu Asp Ile Ala Ser Leu
195 200 205

Arg Gln Lys Phe Glu Ser Thr Glu Tyr Phe Ile Pro Lys Ser Glu Lys
210 215 220

Phe Phe Leu Gly Lys Asp Arg Asn Asn Val Glu Leu Trp Phe Glu Glu
225 230 235 240

Val

09269787 043604

<210> 117

<211> 311

<212> PRT

<213> Streptococcus pneumoniae

<400> 117

Met Lys Trp Thr Lys Ile Ile Lys Lys Ile Glu Glu Gln Ile Glu Ala

1 5 10 15

Gly Ile Tyr Pro Gly Ala Ser Phe Ala Tyr Phe Lys Asp Asn Gln Trp

20 25 30

Thr Glu Phe Tyr Leu Gly Gln Ser Asp Pro Glu His Gly Leu Gln Thr

35 40 45

Glu Ala Gly Leu Val Tyr Asp Leu Ala Ser Val Ser Lys Val Val Gly

50 55 60

Val Gly Thr Val Cys Thr Phe Leu Trp Glu Ile Gly Gln Leu Asp Ile

65 70 75 80

Asp Arg Leu Val Ile Asp Phe Leu Pro Glu Ser Asp Tyr Pro Asp Ile

85 90 95

Thr Ile Arg Gln Leu Leu Thr His Ala Thr Asp Leu Asp Pro Phe Ile

100 105 110

Pro Asn Arg Asp Leu Leu Thr Ala Pro Glu Leu Lys Glu Ala Met Phe

115 120 125

His Leu Asn Arg Arg Ser Gln Pro Ala Phe Leu Tyr Ser Asp Val His

130 135 140

Phe Leu Leu Leu Gly Phe Ile Leu Glu Arg Ile Phe Asn Gln Asp Leu

145 150 155 160

Asp Val Ile Leu Lys Asp Gln Val Trp Lys Pro Trp Gly Met Thr Glu

165 170 175

105210 2525260

252

Thr Lys Phe Gly Pro Val Glu Leu Ala Val Pro Thr Val Arg Gly Val
180 185 190

Glu Ala Gly Ile Val His Asp Pro Lys Ala Arg Leu Leu Gly Arg His
195 200 205

Ala Gly Ser Ala Gly Leu Phe Ser Thr Ile Lys Asp Leu Gln Ile Phe
210 215 220

Leu Glu His Tyr Leu Ala Asp Asp Phe Ala Arg Asp Leu Asn Gln Asn
225 230 235 240

Phe Ser Pro Leu Asp Asp Lys Glu Arg Ser Leu Ala Trp Asn Leu Glu
245 250 255

Gly Asp Trp Leu Asp His Thr Gly Tyr Thr Gly Thr Phe Ile Met Trp
260 265 270

Asn Arg Gln Lys Gln Glu Ala Thr Ile Phe Leu Ser Asn Arg Thr Tyr
275 280 285

Glu Lys Asp Glu Arg Ala Gln Trp Ile Leu Asp Arg Asn Gln Val Met
290 295 300

Asn Leu Ile Arg Lys Glu Glu
305 310

<210> 118

<211> 160

<212> PRT

<213> Streptococcus pneumoniae

<400> 118

Met Met Lys Lys Thr Tyr Asn His Ile Leu Val Trp Gly Val Ile Phe
1 5 10 15

253

Tyr Ser Ile Cys Ile Val Cys Phe Cys Phe Thr Pro Gln Glu Gln Ser
20 25 30

Thr Val Gly Val Gly Thr Pro Gly Ile Gln His Leu Gly Arg Leu Val
35 40 45

Phe Leu Leu Thr Pro Phe Asn Ser Leu Trp Lys Leu Gly Glu Val Ser
50 55 60

Asp Ile Gly Gln Leu Cys Trp Ile Phe Leu Gln Asn Ile Leu Asn Val
65 70 75 80

Phe Leu Phe Phe Pro Leu Ile Phe Gln Leu Leu Tyr Leu Phe Pro Asn
85 90 95

Leu Arg Lys Thr Lys Lys Val Leu Leu Phe Ser Phe Leu Val Ser Leu
100 105 110

Gly Ile Glu Cys Thr Gln Leu Ile Leu Asp Phe Phe Phe Asp Phe Asn
115 120 125

Arg Val Phe Glu Ile Asp Asp Leu Trp Thr Asn Thr Leu Gly Gly Tyr
130 135 140

Leu Ala Trp Leu Leu Tyr Lys Arg Leu His Lys Asn Lys Val Arg Asn
145 150 155 160

<210> 119

<211> 263

<212> PRT

<213> Streptococcus pneumoniae

<400> 119

Met Lys Ile Pro Leu Leu Thr Phe Ala Arg His Lys Phe Val Tyr Val
1 5 10 15

254

Leu Leu Thr Leu Leu Phe Leu Ala Leu Val Tyr Arg Asp Val Leu Met
20 25 30

Thr Tyr Phe Phe Phe Asp Ile His Ala Pro Asp Leu Ala Lys Phe Asp
35 40 45

Gly Gln Ala Ile Lys Asn Asp Leu Leu Lys Ser Ala Leu Asp Phe Arg
50 55 60

Ile Leu Gln Phe Asn Leu Gly Phe Tyr Gln Ser Phe Ile Ile Pro Ile
65 70 75 80

Ile Ile Val Leu Leu Gly Phe Gln Tyr Ile Glu Leu Lys Asn Lys Val
85 90 95

Leu Arg Leu Ser Ile Gly Arg Glu Val Ser Tyr Gln Gly Leu Lys Arg
100 105 110

Lys Leu Thr Leu Gln Val Ala Ser Ile Pro Cys Leu Ile Tyr Leu Val
115 120 125

Thr Val Leu Ile Ile Ala Ile Ile Thr Tyr Phe Phe Gly Thr Phe Ser
130 135 140

Pro Leu Gly Trp Asn Ser Leu Phe Ser Asp Gly Ser Gly Leu Gln Arg
145 150 155 160

Leu Leu Asp Gly Glu Ile Lys Ser Tyr Leu Phe Phe Thr Cys Val Leu
165 170 175

Leu Ile Gly Ile Phe Ile Asn Ala Ile Tyr Phe Leu Gln Ile Val Asp
180 185 190

Tyr Val Gly Asn Val Thr Arg Ser Ala Ile Thr Tyr Leu Met Phe Leu
195 200 205

Trp Leu Gly Ser Met Leu Leu Tyr Ser Ala Leu Pro Tyr Tyr Met Val
210 215 220

105270 0466

255

Pro Met Thr Ser Leu Met Gln Ala Ser Tyr Gly Asp Val Ser Leu Met
225 230 235 240

Lys Leu Phe Thr Pro Tyr Ile Leu Tyr Ile Val Pro Tyr Met Val Leu
245 250 255

Glu Lys Tyr Glu Asp Asn Val
260

<210> 120

<211> 505

<212> PRT

<213> Streptococcus pneumoniae

<400> 120

Met Phe Lys Val Leu Gln Lys Val Gly Lys Ala Phe Met Leu Pro Ile
1 5 10 15

Ala Ile Leu Pro Ala Ala Gly Leu Leu Leu Gly Ile Gly Gly Ala Leu
20 25 30

Ser Asn Pro Thr Thr Ile Ala Thr Tyr Pro Ile Leu Asp Asn Ser Ile
35 40 45

Phe Gln Ser Ile Phe Gln Val Met Ser Ser Ala Gly Glu Val Val Phe
50 55 60

Ser Asn Leu Ser Leu Leu Leu Cys Val Gly Leu Cys Ile Gly Leu Ala
65 70 75 80

Lys Arg Asp Lys Gly Thr Ala Ala Leu Ala Gly Val Thr Gly Tyr Leu
85 90 95

Val Met Thr Ala Thr Ile Lys Ala Leu Val Lys Leu Phe Met Ala Glu
100 105 110

005639 043604

256

Gly Ser Ala Ile Asp Thr Gly Val Ile Gly Ala Leu Val Val Gly Ile
115 120 125

Val Ala Val Tyr Leu His Asn Arg Tyr Asn Asn Ile Gln Leu Pro Ser
130 135 140

Ala Leu Gly Phe Phe Gly Gly Ser Arg Phe Val Pro Ile Val Thr Ser
145 150 155 160

Phe Ser Ser Ile Leu Ile Gly Phe Val Phe Phe Val Ile Trp Pro Pro
165 170 175

Phe Gln Gln Leu Leu Val Ser Thr Gly Gly Tyr Ile Ser Gln Ala Gly
180 185 190

Pro Ile Gly Thr Phe Leu Tyr Gly Phe Leu Met Arg Leu Ser Gly Ala
195 200 205

Val Gly Leu His His Ile Ile Tyr Pro Met Phe Trp Tyr Thr Glu Leu
210 215 220

Gly Gly Val Glu Thr Val Ala Gly Gln Thr Val Val Gly Ala Gln Lys
225 230 235 240

Ile Phe Phe Ala Gln Leu Ala Asp Leu Ala His Ser Gly Leu Phe Thr
245 250 255

Glu Gly Thr Arg Phe Phe Ala Gly Arg Phe Ser Thr Met Met Phe Gly
260 265 270

Leu Pro Ala Ala Cys Leu Ala Met Tyr His Ser Val Pro Lys Asn Arg
275 280 285

Arg Lys Lys Tyr Ala Gly Leu Phe Phe Gly Val Ala Leu Thr Ser Phe
290 295 300

Ile Thr Gly Ile Thr Glu Pro Ile Glu Phe Met Phe Leu Phe Val Ser
305 310 315 320

00369397 013604

257

Pro Val Leu Tyr Val Val His Ala Phe Leu Asp Gly Val Ser Phe Phe
325 330 335

Ile Ala Asp Val Leu Asn Ile Ser Ile Gly Asn Thr Phe Ser Gly Gly
340 345 350

Val Ile Asp Phe Thr Leu Phe Gly Ile Leu Gln Gly Asn Ala Lys Thr
355 360 365

Asn Trp Val Leu Gln Ile Pro Phe Gly Leu Ile Trp Ser Val Leu Tyr
370 375 380

Tyr Ile Ile Phe Arg Trp Phe Ile Thr Gln Phe Asn Val Leu Thr Pro
385 390 395 400

Gly Arg Gly Glu Glu Val Asp Ser Lys Glu Ile Ser Glu Ser Ala Asp
405 410 415

Ser Thr Ser Asn Thr Ala Asp Tyr Leu Lys Gln Asp Ser Leu Gln Ile
420 425 430

Ile Arg Ala Leu Gly Gly Ser Asn Asn Ile Glu Asp Val Asp Ala Cys
435 440 445

Val Thr Arg Leu Arg Val Ala Val Lys Glu Val Asn Gln Val Asp Lys
450 455 460

Ala Leu Leu Lys Gln Ile Gly Ala Val Asp Val Leu Glu Val Lys Gly
465 470 475 480

Gly Ile Gln Ala Ile Tyr Gly Ala Lys Ala Ile Leu Tyr Lys Asn Ser
485 490 495

Ile Asn Glu Ile Leu Gly Val Asp Asp
500 505

1099270 16265260

<210> 121

<211> 442

<212> PRT

<213> Streptococcus pneumoniae

<400> 121

Met Lys Phe Arg Lys Leu Ala Cys Thr Val Leu Ala Gly Ala Ala Val

1

5

10

15

Leu Gly Leu Ala Ala Cys Gly Asn Ser Gly Gly Ser Lys Asp Ala Ala

20

25

30

Lys Ser Gly Gly Asp Gly Ala Lys Thr Glu Ile Thr Trp Trp Ala Phe

35

40

45

Pro Val Phe Thr Gln Glu Lys Thr Gly Asp Gly Val Gly Thr Tyr Glu

50

55

60

Lys Ser Ile Ile Glu Ala Phe Glu Lys Ala Asn Pro Asp Ile Lys Val

65

70

75

80

Lys Leu Glu Thr Ile Asp Phe Lys Ser Gly Pro Glu Lys Ile Thr Thr

85

90

95

Ala Ile Glu Ala Gly Thr Ala Pro Asp Val Leu Phe Asp Ala Pro Gly

100

105

110

Arg Ile Ile Gln Tyr Gly Lys Asn Gly Lys Leu Ala Glu Leu Asn Asp

115

120

125

Leu Phe Thr Asp Glu Phe Val Lys Asp Val Asn Asn Glu Asn Ile Val

130

135

140

Gln Ala Ser Lys Ala Gly Asp Lys Ala Tyr Met Tyr Pro Ile Ser Ser

145

150

155

160

Ala Pro Phe Tyr Met Ala Met Asn Lys Lys Met Leu Glu Asp Ala Gly

165

170

175

00769797 012501

[illegible]

Thr Ser Phe Gly Lys Leu Tyr Glu Asp Lys Arg Met Glu Thr Ile Ser
370 375 380

260

Gly Trp Thr Gln Tyr Tyr Ser Pro Tyr Tyr Asn Thr Ile Asp Gly Phe
385 390 395 400

Ala Glu Met Arg Thr Leu Trp Phe Pro Met Leu Gln Ser Val Ser Asn
405 410 415

Gly Asp Glu Lys Pro Ala Asp Ala Leu Lys Ala Phe Thr Glu Lys Ala
420 425 430

Asn Glu Thr Ile Lys Lys Ala Met Lys Gln
435 440

<210> 122

<211> 279

<212> PRT

<213> Streptococcus pneumoniae

<400> 122

Met Gln Ser Thr Glu Lys Lys Pro Leu Thr Ala Phe Thr Val Ile Ser
1 5 10 15

Thr Ile Ile Leu Leu Leu Leu Thr Val Leu Phe Ile Phe Pro Phe Tyr
20 25 30

Trp Ile Leu Thr Gly Ala Phe Lys Ser Gln Pro Asp Thr Ile Val Ile
35 40 45

Pro Pro Gln Trp Phe Pro Lys Met Pro Thr Met Glu Asn Phe Gln Gln
50 55 60

Leu Met Val Gln Asn Pro Ala Leu Gln Trp Met Trp Asn Ser Val Phe
65 70 75 80

Ile Ser Leu Val Thr Met Phe Leu Val Cys Ala Thr Ser Ser Leu Ala
85 90 95

0076937 013604

261

Gly Tyr Val Leu Ala Lys Lys Arg Phe Tyr Gly Gln Arg Ile Leu Phe
100 105 110

Ala Ile Phe Ile Ala Ala Met Ala Leu Pro Lys Gln Val Val Leu Val
115 120 125

Pro Leu Val Arg Ile Val Asn Phe Met Gly Ile His Asp Thr Leu Trp
130 135 140

Ala Val Ile Leu Pro Leu Ile Gly Trp Pro Phe Gly Val Phe Leu Met
145 150 155 160

Lys Gln Phe Ser Glu Asn Ile Pro Thr Glu Leu Leu Glu Ser Ala Lys
165 170 175

Ile Asp Gly Cys Gly Glu Ile Arg Thr Phe Trp Ser Val Ala Phe Pro
180 185 190

Ile Val Lys Pro Gly Phe Ala Ala Leu Ala Ile Phe Thr Phe Ile Asn
195 200 205

Thr Trp Asn Asp Tyr Phe Met Gln Leu Val Met Leu Thr Ser Arg Asn
210 215 220

Asn Leu Thr Ile Ser Leu Gly Val Ala Thr Met Gln Ala Glu Met Ala
225 230 235 240

Thr Asn Tyr Gly Leu Ile Met Ala Gly Ala Ala Leu Ala Ala Val Pro
245 250 255

Ile Val Thr Val Phe Leu Val Phe Gln Lys Ser Phe Thr Gln Gly Ile
260 265 270

Thr Met Gly Ala Val Lys Gly
275

00759787 012504

<210> 123

<211> 216

<212> PRT

<213> Streptococcus pneumoniae

<400> 123

Met Lys Ile Met Phe Lys Asn Phe Asn Asn Ile Leu Leu Asn Arg Lys
 1 5 10 15

Ile Val Leu Leu Leu Arg Ile Val Leu Met Met Ile Leu Ile Asn His
 20 25 30

Leu Leu Ser Thr Ala Val Gln Lys Gln Asp Ala Val Ile Phe Phe Lys
 35 40 45

Arg Glu Leu Ile Ser Ile Phe Ser Tyr Asn Asp Tyr Ser Glu Ala Asn
 50 55 60

Leu Glu Ile Pro Lys Leu Leu Leu Asn Leu Ser Leu Phe Met Val Gly
 65 70 75 80

Trp Leu Ser Val Ile Leu Leu Glu Ser Asp Leu Ala Asp His Tyr His
 85 90 95

His Leu Ile Arg Tyr Gln Ser Ser Ser Phe Phe Asp Tyr Thr Arg Lys
 100 105 110

Arg Leu Val Val Ile Ser Lys Phe Phe Thr Gln Asp Leu Phe Val Trp
 115 120 125

Phe Leu Gly Leu Leu Pro Leu Gly Ile His Phe Lys Thr Val Ala Leu
 130 135 140

Phe Phe Leu Leu Ala Gln Leu Met Met Leu Tyr Leu Leu Leu Ser Tyr
 145 150 155 160

Leu Ile Ala Leu Ile Ser Ala Gly Ala Gly Phe Ser Phe Phe Leu Tyr
 165 170 175

005693-013604
 109270-1546560

263

Phe Leu Ala Phe Val Gly Gln Glu Trp Met Met Asp His Ile Val Thr
180 185 190

Val Tyr Leu Val Leu Leu Ser Leu Leu Val Met Leu Ile Val Ser Arg
195 200 205

Leu Glu Glu Lys Phe Lys Lys Gly
210 215

<210> 124

<211> 174

<212> PRT

<213> Streptococcus pneumoniae

<400> 124

Met Gly Lys Gly Glu Met Gly Lys Gly Val Ile Gly Leu Glu Phe Asp
1 5 10 15

Ser Glu Val Leu Val Asn Lys Ala Pro Thr Leu Gln Leu Ala Asn Gly
20 25 30

Lys Thr Ala Thr Phe Leu Thr Gln Tyr Asp Ser Lys Thr Leu Leu Phe
35 40 45

Ala Val Asp Lys Glu Asp Ile Gly Gln Glu Ile Ile Gly Ile Ala Lys
50 55 60

Gly Ser Ile Glu Ser Met His Asn Leu Pro Val Asn Leu Ala Gly Ala
65 70 75 80

Arg Val Pro Gly Gly Val Asn Gly Ser Lys Ala Ala Val His Glu Val
85 90 95

Pro Glu Phe Thr Gly Gly Val Asn Gly Thr Glu Pro Ala Val His Glu
100 105 110

00769787-042604

264

Ile Ala Glu Tyr Lys Gly Ser Asp Ser Leu Val Thr Leu Thr Thr Lys
115 120 125

Lys Asp Tyr Thr Tyr Lys Ala Pro Leu Ala Gln Gln Ala Leu Pro Glu
130 135 140

Thr Gly Asn Lys Glu Ser Asp Leu Leu Ala Ser Leu Gly Leu Thr Ala
145 150 155 160

Phe Phe Leu Gly Leu Phe Thr Leu Gly Lys Lys Arg Glu Gln
165 170

<210> 125

<211> 629

<212> PRT

<213> Streptococcus pneumoniae

<400> 125

Met Lys Lys Thr Phe Phe Leu Leu Val Leu Gly Leu Phe Cys Leu Leu
1 5 10 15

Pro Leu Ser Val Phe Ala Ile Asp Phe Lys Ile Asn Ser Tyr Gln Gly
20 25 30

Asp Leu Tyr Ile His Ala Asp Asn Thr Ala Glu Phe Arg Gln Lys Ile
35 40 45

Val Tyr Gln Phe Glu Glu Asp Phe Lys Gly Gln Ile Val Gly Leu Gly
50 55 60

Arg Ala Gly Lys Met Pro Ser Gly Phe Asp Ile Asp Pro His Pro Lys
65 70 75 80

Ile Gln Ala Ala Lys Asn Gly Ala Glu Leu Ala Asp Val Thr Ser Glu
85 90 95

096979 01504

265

Val Thr Glu Glu Ala Asp Gly Tyr Thr Val Arg Val Tyr Asn Pro Gly
100 105 110

Gln Glu Gly Asp Ile Val Glu Val Asp Leu Val Trp Asn Leu Lys Asn
115 120 125

Leu Leu Phe Leu Tyr Asp Asp Ile Ala Glu Leu Asn Trp Gln Pro Leu
130 135 140

Thr Asp Ser Ser Glu Ser Ile Glu Lys Phe Glu Phe His Val Arg Gly
145 150 155 160

Asp Lys Gly Ala Glu Lys Leu Phe Phe His Thr Gly Lys Leu Phe Arg
165 170 175

Glu Gly Thr Ile Glu Lys Ser Asn Leu Asp Tyr Thr Ile Arg Leu Asp
180 185 190

Asn Leu Pro Ala Lys Arg Gly Val Glu Leu His Ala Tyr Trp Pro Arg
195 200 205

Thr Asp Phe Ala Ser Ala Arg Asp Gln Gly Leu Lys Gly Asn Arg Leu
210 215 220

Glu Glu Phe Asn Lys Ile Glu Asp Ser Ile Val Arg Glu Lys Asp Gln
225 230 235 240

Ser Lys Gln Leu Val Thr Trp Val Leu Pro Ser Ile Leu Ser Ile Ser
245 250 255

Leu Leu Leu Ser Val Cys Phe Tyr Phe Ile Tyr Arg Arg Lys Thr Thr
260 265 270

Pro Ser Val Lys Tyr Ala Lys Asn His Arg Leu Tyr Glu Pro Pro Met
275 280 285

Glu Leu Glu Pro Met Val Leu Ser Glu Ala Val Tyr Ser Thr Ser Leu
290 295 300

105270 18259260

266

Glu Glu Val Ser Pro Leu Val Lys Gly Ala Gly Lys Phe Thr Phe Asp
305 310 315 320

Gln Leu Ile Gln Ala Thr Leu Leu Asp Val Ile Asp Arg Gly Asn Val
325 330 335

Ser Ile Ile Ser Glu Gly Asp Ala Val Gly Leu Arg Leu Val Lys Glu
340 345 350

Asp Gly Leu Ser Ser Phe Glu Lys Asp Cys Leu Asn Leu Ala Phe Ser
355 360 365

Gly Lys Lys Glu Glu Thr Leu Ser Asn Leu Phe Ala Asp Tyr Lys Val
370 375 380

Ser Asp Ser Leu Tyr Arg Arg Ala Lys Val Ser Asp Glu Lys Arg Ile
385 390 395 400

Gln Ala Arg Gly Leu Gln Leu Lys Ser Ser Phe Glu Glu Val Leu Asn
405 410 415

Gln Met Gln Glu Gly Val Arg Lys Arg Val Ser Phe Trp Gly Leu Pro
420 425 430

Asp Tyr Tyr Arg Pro Leu Thr Gly Gly Glu Lys Ala Leu Gln Val Gly
435 440 445

Met Gly Ala Leu Thr Ile Leu Pro Leu Phe Ile Gly Phe Gly Leu Phe
450 455 460

Leu Tyr Ser Leu Asp Val His Gly Tyr Leu Tyr Leu Pro Leu Pro Ile
465 470 475 480

Leu Gly Phe Leu Gly Leu Val Leu Ser Val Phe Tyr Tyr Trp Lys Leu
485 490 495

Arg Leu Asp Asn Arg Asp Gly Val Leu Asn Glu Ala Gly Ala Glu Val
500 505 510

00269787 013601

267

Tyr Tyr Leu Trp Thr Ser Phe Glu Asn Met Leu Arg Glu Ile Ala Arg
515 520 525

Leu Asp Gln Ala Glu Leu Glu Ser Ile Val Val Trp Asn Arg Leu Leu
530 535 540

Val Tyr Ala Thr Leu Phe Gly Tyr Ala Asp Lys Val Ser His Leu Met
545 550 555 560

Lys Val His Gln Ile Gln Val Glu Asn Pro Asp Ile Asn Leu Tyr Val
565 570 575

Ala Tyr Gly Trp His Ser Thr Phe Tyr His Ser Thr Ala Gln Met Ser
580 585 590

His Tyr Ala Ser Val Ala Asn Thr Ala Ser Thr Tyr Ser Val Ser Ser
595 600 605

Gly Ser Gly Ser Ser Gly Gly Gly Phe Ser Gly Gly Gly Gly Gly Gly
610 615 620

Ser Ile Gly Ala Phe
625

<210> 126

<211> 886

<212> PRT

<213> Streptococcus pneumoniae

<400> 126

Met Lys Lys Val Arg Lys Ile Phe Gln Lys Ala Val Ala Gly Leu Cys
1 5 10 15

Cys Ile Ser Gln Leu Thr Ala Phe Ser Ser Ile Val Ala Leu Ala Glu
20 25 30

09769767 012504

Thr Pro Glu Thr Ser Pro Ala Ile Gly Lys Val Val Ile Lys Glu Thr
35 40 45

Gly Glu Gly Gly Ala Leu Leu Gly Asp Ala Val Phe Glu Leu Lys Asn
50 55 60

Asn Thr Asp Gly Thr Thr Val Ser Gln Arg Thr Glu Ala Gln Thr Gly
65 70 75 80

Glu Ala Ile Phe Ser Asn Ile Lys Pro Gly Thr Tyr Thr Leu Thr Glu
85 90 95

Ala Gln Pro Pro Val Gly Tyr Lys Pro Ser Thr Lys Gln Trp Thr Val
100 105 110

Glu Val Glu Lys Asn Gly Arg Thr Thr Val Gln Gly Glu Gln Val Glu
115 120 125

Asn Arg Glu Glu Ala Leu Ser Asp Gln Tyr Pro Gln Thr Gly Thr Tyr
130 135 140

Pro Asp Val Gln Thr Pro Tyr Gln Ile Ile Lys Val Asp Gly Ser Glu
145 150 155 160

Lys Asn Gly Gln His Lys Ala Leu Asn Pro Asn Pro Tyr Glu Arg Val
165 170 175

Ile Pro Glu Gly Thr Leu Ser Lys Arg Ile Tyr Gln Val Asn Asn Leu
180 185 190

Asp Asp Asn Gln Tyr Gly Ile Glu Leu Thr Val Ser Gly Lys Thr Val
195 200 205

Tyr Glu Gln Lys Asp Lys Ser Val Pro Leu Asp Val Val Ile Leu Leu
210 215 220

Asp Asn Ser Asn Ser Met Ser Asn Ile Arg Asn Lys Asn Ala Arg Arg
225 230 235 240

00563 01354
F05210 2829260

269

Ala Glu Arg Ala Gly Glu Ala Thr Arg Ser Leu Ile Asp Lys Ile Thr
245 250 255

Ser Asp Ser Glu Asn Arg Val Ala Leu Val Thr Tyr Ala Ser Thr Ile
260 265 270

Phe Asp Gly Thr Glu Phe Thr Val Glu Lys Gly Val Ala Asp Lys Asn
275 280 285

Gly Lys Arg Leu Asn Asp Ser Leu Phe Trp Asn Tyr Asp Gln Thr Ser
290 295 300

Phe Thr Thr Asn Thr Lys Asp Tyr Ser Tyr Leu Lys Leu Thr Asn Asp
305 310 315 320

Lys Asn Asp Ile Val Glu Leu Lys Asn Lys Val Pro Thr Glu Ala Glu
325 330 335

Asp His Asp Gly Asn Arg Leu Met Tyr Gln Phe Gly Ala Thr Phe Thr
340 345 350

Gln Lys Ala Leu Met Lys Ala Asp Glu Ile Leu Thr Gln Gln Ala Arg
355 360 365

Gln Asn Ser Gln Lys Val Ile Phe His Ile Thr Asp Gly Val Pro Thr
370 375 380

Met Ser Tyr Pro Ile Asn Phe Asn His Ala Thr Phe Ala Pro Ser Tyr
385 390 395 400

Gln Asn Gln Leu Asn Ala Phe Phe Ser Lys Ser Pro Asn Lys Asp Gly
405 410 415

Ile Leu Leu Ser Asp Phe Ile Thr Gln Ala Thr Ser Gly Glu His Thr
420 425 430

Ile Val Arg Gly Asp Gly Gln Ser Tyr Gln Met Phe Thr Asp Lys Thr
435 440 445

00769767 013501

[illegible]

Lys Asn Ala Lys Val Leu Tyr Asp Thr Thr Glu Lys Arg Ile Arg Val
645 650 655

271

Thr Gly Leu Tyr Leu Gly Thr Asp Glu Lys Val Thr Leu Thr Tyr Asn
660 665 670

Val Arg Leu Asn Asp Glu Phe Val Ser Asn Lys Phe Tyr Asp Thr Asn
675 680 685

Gly Arg Thr Thr Leu His Pro Lys Glu Val Glu Gln Asn Thr Val Arg
690 695 700

Asp Phe Pro Ile Pro Lys Ile Arg Asp Val Arg Lys Tyr Pro Glu Ile
705 710 715 720

Thr Ile Ser Lys Glu Lys Lys Leu Gly Asp Ile Glu Phe Ile Lys Val
725 730 735

Asn Lys Asn Asp Lys Lys Pro Leu Arg Gly Ala Val Phe Ser Leu Gln
740 745 750

Lys Gln His Pro Asp Tyr Pro Asp Ile Tyr Gly Ala Ile Asp Gln Asn
755 760 765

Gly Thr Tyr Gln Asn Val Arg Thr Gly Glu Asp Gly Lys Leu Thr Phe
770 775 780

Lys Asn Leu Ser Asp Gly Lys Tyr Arg Leu Phe Glu Asn Ser Glu Pro
785 790 795 800

Ala Gly Tyr Lys Pro Val Gln Asn Lys Pro Ile Val Ala Phe Gln Ile
805 810 815

Val Asn Gly Glu Val Arg Asp Val Thr Ser Ile Val Pro Gln Asp Ile
820 825 830

Pro Ala Gly Tyr Glu Phe Thr Asn Asp Lys His Tyr Ile Thr Asn Glu
835 840 845

Pro Ile Pro Pro Lys Arg Glu Tyr Pro Arg Thr Gly Gly Ile Gly Met
850 855 860

09769797 043604

272

Leu Pro Phe Tyr Leu Ile Gly Cys Met Met Met Gly Gly Val Leu Leu
865 870 875 880

Tyr Thr Arg Lys His Pro
885

<210> 127

<211> 665

<212> PRT

<213> Streptococcus pneumoniae

<400> 127

Met Lys Ser Ile Asn Lys Phe Leu Thr Met Leu Ala Ala Leu Leu Leu
1 5 10 15

Thr Ala Ser Ser Leu Phe Ser Ala Ala Thr Val Phe Ala Ala Gly Thr
20 25 30

Thr Thr Thr Ser Val Thr Val His Lys Leu Leu Ala Thr Asp Gly Asp
35 40 45

Met Asp Lys Ile Ala Asn Glu Leu Glu Thr Gly Asn Tyr Ala Gly Asn
50 55 60

Lys Val Gly Val Leu Pro Ala Asn Ala Lys Glu Ile Ala Gly Val Met
65 70 75 80

Phe Val Trp Thr Asn Thr Asn Asn Glu Ile Ile Asp Glu Asn Gly Gln
85 90 95

Thr Leu Gly Val Asn Ile Asp Pro Gln Thr Phe Lys Leu Ser Gly Ala
100 105 110

Met Pro Ala Thr Ala Met Lys Lys Leu Thr Glu Ala Glu Gly Ala Lys
115 120 125

009970 04360

273

Phe Asn Thr Ala Asn Leu Pro Ala Ala Lys Tyr Lys Ile Tyr Glu Ile
130 135 140

His Ser Leu Ser Thr Tyr Val Gly Glu Asp Gly Ala Thr Leu Thr Gly
145 150 155 160

Ser Lys Ala Val Pro Ile Glu Ile Glu Leu Pro Leu Asn Asp Val Val
165 170 175

Asp Ala His Val Tyr Pro Lys Asn Thr Glu Ala Lys Pro Lys Ile Asp
180 185 190

Lys Asp Phe Lys Gly Lys Ala Asn Pro Asp Thr Pro Arg Val Asp Lys
195 200 205

Asp Thr Pro Val Asn His Gln Val Gly Asp Val Val Glu Tyr Glu Ile
210 215 220

Val Thr Lys Ile Pro Ala Leu Ala Asn Tyr Ala Thr Ala Asn Trp Ser
225 230 235 240

Asp Arg Met Thr Glu Gly Leu Ala Phe Asn Lys Gly Thr Val Lys Val
245 250 255

Thr Val Asp Asp Val Ala Leu Glu Ala Gly Asp Tyr Ala Leu Thr Glu
260 265 270

Val Ala Thr Gly Phe Asp Leu Lys Leu Thr Asp Ala Gly Leu Ala Lys
275 280 285

Val Asn Asp Gln Asn Ala Glu Lys Thr Val Lys Ile Thr Tyr Ser Ala
290 295 300

Thr Leu Asn Asp Lys Ala Ile Val Glu Val Pro Glu Ser Asn Asp Val
305 310 315 320

Thr Phe Asn Tyr Gly Asn Asn Pro Asp His Gly Asn Thr Pro Lys Pro
325 330 335

00769787 013601

Ala Tyr Asn Ala Ala Val Ile Ala Ala Asn Asn Ala Phe Glu Trp Val
530 535 540

275

Ala Asp Lys Asp Asn Glu Asn Val Val Lys Leu Val Ser Asp Ala Gln
545 550 555 560

Gly Arg Phe Glu Ile Thr Gly Leu Leu Ala Gly Thr Tyr Tyr Leu Glu
565 570 575

Glu Thr Lys Gln Pro Ala Gly Tyr Ala Leu Leu Thr Ser Arg Gln Lys
580 585 590

Phe Glu Val Thr Ala Thr Ser Tyr Ser Ala Thr Gly Gln Gly Ile Glu
595 600 605

Tyr Thr Ala Gly Ser Gly Lys Asp Asp Ala Thr Lys Val Val Asn Lys
610 615 620

Lys Ile Thr Ile Pro Gln Thr Gly Gly Ile Gly Thr Ile Ile Phe Ala
625 630 635 640

Val Ala Gly Ala Ala Ile Met Gly Ile Ala Val Tyr Ala Tyr Val Lys
645 650 655

Asn Asn Lys Asp Glu Asp Gln Leu Ala
660 665

<210> 128

<211> 390

<212> PRT

<213> Streptococcus pneumoniae

<400> 128

Met Thr Met Gln Lys Met Gln Lys Met Ile Ser Arg Ile Phe Phe Val
1 5 10 15

Met Ala Leu Cys Phe Ser Leu Val Trp Gly Ala His Ala Val Gln Ala
20 25 30

00769787 042504

Asn Tyr Arg Phe Lys Glu Val Glu Pro Leu Ala Gly Tyr Ala Val Thr
225 230 235 240

277

Thr Leu Asp Thr Asp Val Gln Leu Val Asp His Gln Leu Val Thr Ile
245 250 255

Thr Val Val Asn Gln Lys Leu Pro Arg Gly Asn Val Asp Phe Met Lys
260 265 270

Val Asp Gly Arg Thr Asn Thr Ser Leu Gln Gly Ala Met Phe Lys Val
275 280 285

Met Lys Glu Glu Ser Gly His Tyr Thr Pro Val Leu Gln Asn Gly Lys
290 295 300

Glu Val Val Val Thr Ser Gly Lys Asp Gly Arg Phe Arg Val Glu Gly
305 310 315 320

Leu Glu Tyr Gly Thr Tyr Tyr Leu Trp Glu Leu Gln Ala Pro Thr Gly
325 330 335

Tyr Val Gln Leu Thr Ser Pro Val Ser Phe Thr Ile Gly Lys Asp Thr
340 345 350

Arg Lys Glu Leu Val Thr Val Val Lys Asn Asn Lys Arg Pro Arg Ile
355 360 365

Asp Val Pro Asp Thr Gly Glu Glu Thr Leu Val Tyr Leu Asp Ala Cys
370 375 380

Cys His Phe Val Val Trp
385 390

00769787 012501

<210> 129

<211> 521

<212> PRT

<213> Streptococcus pneumoniae

<400> 129

Met Ser His Ile Tyr Leu Ser Ile Phe Thr Ser Leu Leu Leu Met Leu

1

5

10

15

Gly Leu Val Asn Val Ala Gln Ala Asp Glu Tyr Leu Arg Ile Gly Met

20

25

30

Glu Ala Ala Tyr Ala Pro Phe Asn Trp Thr Gln Asp Asp Asp Ser Asn

35

40

45

Gly Ala Val Lys Ile Asp Gly Thr Asn Gln Tyr Ala Asn Gly Tyr Asp

50

55

60

Val Gln Ile Ala Lys Lys Ile Ala Lys Asp Leu Gly Lys Glu Pro Leu

65

70

75

80

Val Val Lys Thr Lys Trp Glu Gly Leu Val Pro Ala Leu Thr Ser Gly

85

90

95

Lys Ile Asp Met Ile Ile Ala Gly Met Ser Pro Thr Ala Glu Arg Lys

100

105

110

Gln Glu Ile Ala Phe Ser Ser Ser Tyr Tyr Thr Ser Glu Pro Val Leu

115

120

125

Leu Val Lys Lys Asp Ser Ala Tyr Ala Ser Ala Lys Ser Leu Asp Asp

130

135

140

Phe Asn Gly Ala Lys Ile Thr Ser Gln Gln Gly Val Tyr Leu Tyr Asn

145

150

155

160

Leu Ile Ala Gln Ile Pro Gly Ala Lys Lys Glu Thr Ala Met Gly Asp

165

170

175

00769797 013694

279

Phe Ala Gln Met Arg Gln Ala Leu Glu Ala Gly Val Ile Asp Ala Tyr
180 185 190

Val Ser Glu Arg Pro Glu Ala Leu Thr Ala Glu Ala Ala Asn Ser Lys
195 200 205

Phe Lys Met Ile Gln Val Glu Pro Gly Phe Lys Thr Gly Glu Glu Asp
210 215 220

Thr Ala Ile Ala Ile Gly Leu Arg Lys Asn Asp Asn Arg Ile Ser Gln
225 230 235 240

Ile Asn Ala Ser Ile Glu Thr Ile Ser Lys Asp Asp Gln Val Ala Leu
245 250 255

Met Asp Arg Met Ile Lys Glu Gln Pro Ala Glu Ala Thr Thr Thr Glu
260 265 270

Glu Thr Ser Ser Ser Phe Phe Ser Gln Val Ala Lys Ile Leu Ser Glu
275 280 285

Asn Trp Gln Gln Leu Leu Arg Gly Ala Gly Ile Thr Leu Leu Ile Ser
290 295 300

Ile Val Gly Thr Ile Ile Gly Leu Ile Ile Gly Leu Ala Ile Gly Val
305 310 315 320

Phe Arg Thr Ala Pro Leu Ser Glu Asn Lys Val Ile Tyr Gly Leu Gln
325 330 335

Lys Leu Val Gly Trp Val Leu Asn Val Tyr Ile Glu Ile Phe Arg Gly
340 345 350

Thr Pro Met Ile Val Gln Ser Met Val Ile Tyr Tyr Gly Thr Ala Gln
355 360 365

Ala Phe Gly Ile Asn Leu Asp Arg Thr Leu Ala Ala Ile Phe Ile Val
370 375 380

005697 013601

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
2	2	1	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
3	3	2	1	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
4	4	3	2	1	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
5	5	4	3	2	1	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80																				

Met Thr Gln Ala Ile Leu Glu Ile Lys His Leu Lys Lys Ser Tyr Gly
1 5 10 15

281

Gln Asn Glu Val Leu Lys Asp Ile Ser Leu Thr Val His Lys Gly Glu
20 25 30

Val Ile Ser Ile Ile Gly Ser Ser Gly Ser Gly Lys Ser Thr Phe Leu
35 40 45

Arg Ser Ile Asn Leu Leu Glu Thr Pro Thr Asp Gly Gln Ile Leu Tyr
50 55 60

His Gly Gln Asn Val Leu Glu Lys Gly Tyr Asp Leu Thr Gln Tyr Arg
65 70 75 80

Glu Lys Leu Gly Met Val Phe Gln Ser Phe Asn Leu Phe Glu Asn Leu
85 90 95

Asn Val Leu Glu Asn Thr Ile Val Ala Gln Thr Thr Val Leu Lys Arg
100 105 110

Glu Arg Thr Glu Ala Glu Lys Ile Ala Lys Glu Asn Leu Glu Lys Val
115 120 125

Gly Met Gly Glu Arg Tyr Trp Gln Ala Lys Pro Lys Gln Leu Ser Gly
130 135 140

Gly Gln Lys Gln Arg Val Ala Ile Ala Arg Ala Leu Ser Met Asn Pro
145 150 155 160

Asp Ala Ile Leu Phe Asp Glu Pro Thr Ser Ala Leu Asp Pro Glu Met
165 170 175

Val Gly Glu Val Leu Lys Ile Met Gln Asp Leu Ala Gln Glu Gly Leu
180 185 190

Thr Met Ile Val Val Thr His Glu Met Glu Phe Ala Arg Asp Val Ser
195 200 205

His Arg Val Ile Phe Met Asp Lys Gly Val Ile Ala Glu Glu Gly Lys
210 215 220

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Leu Ile Gly Tyr Ser Gly Thr Asn Phe Ala Glu Leu Gly Ile Tyr Ile
115 120 125

283

Ala Leu Phe Phe Leu Val Pro Leu Met Glu Glu Leu Ile Tyr Arg Gly
130 135 140

Leu Leu Gln His Ala Phe Phe Lys His Ser Arg Phe Gly Leu Asp Leu
145 150 155 160

Leu Leu Pro Ser Ile Leu Phe Ala Leu Pro His Phe Ser Ser Leu Pro
165 170 175

Ser Leu Leu Asp Ile Phe Val Phe Ala Thr Val Gly Ile Ile Phe Ala
180 185 190

Gly Leu Thr Arg Tyr Thr Lys Ser Ile Tyr Pro Ser Tyr Ala Val His
195 200 205

Val Ile Asn Asn Ile Val Ala Thr Phe Pro Phe Leu Leu Thr Phe Leu
210 215 220

His Arg Val Leu Gly
225

<210> 132

<211> 350

<212> PRT

<213> Streptococcus pneumoniae

<400> 132

Met Asn Lys Lys Gln Trp Leu Gly Leu Gly Leu Val Ala Val Ala Ala
1 5 10 15

Val Gly Leu Ala Ala Cys Gly Asn Arg Ser Ser Arg Asn Ala Ala Ser
20 25 30

Ser Ser Asp Val Lys Thr Lys Ala Ala Ile Val Thr Asp Thr Gly Gly
35 40 45

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284

Val Asp Asp Lys Ser Phe Asn Gln Ser Ala Trp Glu Gly Leu Gln Ala
50 55 60

Trp Gly Lys Glu His Asn Leu Ser Lys Asp Asn Gly Phe Thr Tyr Phe
65 70 75 80

Gln Ser Thr Ser Glu Ala Asp Tyr Ala Asn Asn Leu Gln Gln Ala Ala
85 90 95

Gly Ser Tyr Asn Leu Ile Phe Gly Val Gly Phe Ala Leu Asn Asn Ala
100 105 110

Val Lys Asp Ala Ala Lys Glu His Thr Asp Leu Asn Tyr Val Leu Ile
115 120 125

Asp Asp Val Ile Lys Asp Gln Lys Asn Val Ala Ser Val Thr Phe Ala
130 135 140

Asp Asn Glu Ser Gly Tyr Leu Ala Gly Val Ala Ala Ala Lys Thr Thr
145 150 155 160

Lys Thr Lys Gln Val Gly Phe Val Gly Gly Ile Glu Ser Glu Val Ile
165 170 175

Ser Arg Phe Glu Ala Gly Phe Lys Ala Gly Val Ala Ser Val Asp Pro
180 185 190

Ser Ile Lys Val Gln Val Asp Tyr Ala Gly Ser Phe Gly Asp Ala Ala
195 200 205

Lys Gly Lys Thr Ile Ala Ala Ala Gln Tyr Ala Ala Gly Ala Asp Ile
210 215 220

Val Tyr Gln Val Ala Gly Gly Thr Gly Ala Gly Val Phe Ala Glu Ala
225 230 235 240

Lys Ser Leu Asn Glu Ser Arg Pro Glu Asn Glu Lys Val Trp Val Ile
245 250 255

00269787 043604

[illegible]

Arg Gly Ile Gly Glu Ile Phe Arg Ala Met Gly Pro Leu Val Leu Ile
50 55 60

286

Gly Leu Gly Phe Ala Val Ala Ser Arg Ala Gly Phe Phe Asn Val Gly
65 70 75 80

Leu Pro Gly Gln Ala Leu Ala Gly Trp Ile Leu Ser Gly Trp Phe Ala
85 90 95

Leu Ser His Pro Asp Met Pro Arg Pro Leu Met Ile Leu Ala Thr Ile
100 105 110

Val Ile Ala Leu Ile Ala Gly Gly Ile Val Gly Ala Ile Pro Gly Ile
115 120 125

Leu Arg Ala Tyr Leu Gly Thr Ser Glu Val Ile Val Thr Ile Met Met
130 135 140

Asn Tyr Ile Val Leu Tyr Val Gly Asn Ala Phe Ile His Ala Phe Pro
145 150 155 160

Lys Asp Phe Met Gln Ser Thr Asp Ser Thr Ile Arg Val Gly Ala Asn
165 170 175

Ala Thr Tyr Gln Thr Pro Trp Leu Ala Glu Leu Thr Gly Asn Ser Arg
180 185 190

Met Asn Ile Gly Ile Phe Phe Ala Ile Ile Ala Val Ala Val Ile Trp
195 200 205

Phe Met Leu Lys Lys Thr Thr Leu Gly Phe Glu Ile Arg Ala Val Gly
210 215 220

Leu Asn Pro His Ala Ser Glu Tyr Ala Gly Ile Ser Ala Lys Arg Thr
225 230 235 240

Ile Ile Leu Ser Met Ile Ile Ser Gly Ala Leu Ala Gly Leu Gly Gly
245 250 255

Ala Val Glu Gly Leu Gly Thr Phe Gln Asn Val Tyr Val Gln Gly Ser
260 265 270

09769787 04504

287

Ser Leu Ala Ile Gly Phe Asn Gly Met Ala Val Ser Leu Leu Ala Ala
275 280 285

Asn Ser Pro Ile Gly Ile Leu Phe Ala Ala Phe Leu Phe Gly Val Leu
290 295 300

Gln Val Gly Ala Pro Gly Met Asn Ala Ala Gln Val Pro Ser Glu Leu
305 310 315 320

Val Ser Ile Val Thr Ala Ser Ile Ile Phe Phe Val Ser Val His Tyr
325 330 335

Leu Ile Glu Arg Phe Val Lys Pro Lys Lys Gln Val Lys Gly Gly Lys
340 345 350

<210> 134

<211> 276

<212> PRT

<213> Streptococcus pneumoniae

<400> 134

Met Gly Val Lys Lys Lys Leu Lys Leu Thr Ser Leu Leu Gly Leu Ser
1 5 10 15

Leu Leu Ile Met Thr Ala Cys Ala Thr Asn Gly Val Thr Ser Asp Ile
20 25 30

Thr Ala Glu Ser Ala Asp Phe Trp Ser Lys Leu Val Tyr Phe Phe Ala
35 40 45

Glu Ile Ile Arg Phe Leu Ser Phe Asp Ile Ser Ile Gly Val Gly Ile
50 55 60

Ile Leu Phe Thr Val Leu Ile Arg Thr Val Leu Leu Pro Val Phe Gln
65 70 75 80

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1092710-15169260

288

Val Gln Met Val Ala Ser Arg Lys Met Gln Glu Ala Gln Pro Arg Ile
85 90 95

Lys Ala Leu Arg Glu Gln Tyr Pro Gly Arg Asp Met Glu Ser Arg Thr
100 105 110

Lys Leu Glu Gln Glu Met Arg Lys Val Phe Lys Glu Met Gly Val Arg
115 120 125

Gln Ser Asp Ser Leu Trp Pro Ile Leu Ile Gln Met Pro Val Ile Leu
130 135 140

Ala Leu Phe Gln Ala Leu Ser Arg Val Asp Phe Leu Lys Thr Gly His
145 150 155 160

Phe Leu Trp Ile Asn Leu Gly Ser Val Asp Thr Thr Leu Val Leu Pro
165 170 175

Ile Leu Ala Ala Val Phe Thr Phe Leu Ser Thr Trp Leu Ser Asn Lys
180 185 190

Ala Leu Ser Glu Arg Asn Gly Ala Thr Thr Ala Met Met Tyr Gly Ile
195 200 205

Pro Val Leu Ile Phe Ile Phe Ala Val Tyr Ala Pro Gly Gly Val Ala
210 215 220

Leu Tyr Trp Thr Val Ser Asn Ala Tyr Gln Val Leu Gln Thr Tyr Phe
225 230 235 240

Leu Asn Asn Pro Phe Lys Ile Ile Ala Glu Arg Glu Ala Val Val Gln
245 250 255

Ala Gln Lys Asp Leu Glu Asn Arg Lys Arg Lys Ala Lys Lys Lys Ala
260 265 270

Gln Lys Thr Lys
275

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<210> 135

<211> 264

<212> PRT

<213> Streptococcus pneumoniae

<400> 135

Met Val Ile Asp Pro Phe Ala Ile Asn Glu Leu Asp Tyr Tyr Leu Val
 1 5 10 15

Ser His Phe His Ser Asp His Ile Asp Pro Tyr Thr Ala Ala Ala Ile
 20 25 30

Leu Asn Asn Pro Lys Leu Glu His Val Lys Phe Ile Gly Pro Tyr His
 35 40 45

Cys Gly Arg Ile Trp Glu Gly Trp Gly Val Pro Lys Glu Arg Ile Ile
 50 55 60

Val Val Lys Pro Gly Asp Thr Ile Glu Leu Lys Asp Met Lys Ile His
 65 70 75 80

Ala Val Glu Ser Phe Asp Arg Thr Cys Leu Val Thr Leu Pro Val Asn
 85 90 95

Gly Ala Asp Glu Thr Gly Gly Glu Leu Ala Gly Leu Ala Val Thr Asp
 100 105 110

Glu Glu Met Ala Gln Lys Ala Val Asn Tyr Ile Phe Glu Thr Pro Gly
 115 120 125

Gly Thr Ile Tyr His Gly Ala Asp Ser His Phe Ser Asn Tyr Phe Ala
 130 135 140

Lys His Gly Lys Asp Phe Lys Ile Asp Val Ala Leu Asn Asn Tyr Gly
 145 150 155 160

00760787 01E501

290

Glu Asn Pro Val Gly Ile Gln Asp Lys Met Thr Ser Ile Asp Leu Leu
165 170 175

Arg Met Ala Glu Asn Leu Arg Thr Lys Val Ile Ile Pro Val His Tyr
180 185 190

Asp Ile Trp Ser Asn Phe Met Ala Ser Thr Asn Glu Ile Leu Glu Leu
195 200 205

Trp Lys Met Arg Lys Asp Arg Leu Gln Tyr Asp Phe His Pro Phe Ile
210 215 220

Trp Glu Val Gly Gly Lys Tyr Thr Tyr Pro Gln Asp Gln His Leu Val
225 230 235 240

Glu Tyr His His Pro Arg Gly Phe Asp Asp Cys Phe Glu Gln Asp Ser
245 250 255

Asn Ile Gln Phe Lys Ala Leu Leu
260

<210> 136

<211> 194

<212> PRT

<213> Streptococcus pneumoniae

<400> 136

Met Phe Leu Ser Gly Trp Leu Ser Ser Phe Ala Asn Thr Tyr Ile His
1 5 10 15

Asp Leu Leu Gly Val Leu Phe Pro Asp Ser Pro Phe Leu Asn Ala Phe
20 25 30

Glu Ser Ala Ile Ala Ala Pro Leu Val Glu Glu Pro Leu Lys Leu Leu
35 40 45

00769787 013604

291

Ser Leu Val Phe Val Leu Ala Leu Ile Pro Val Arg Lys Leu Lys Ser
50 55 60

Leu Phe Leu Leu Gly Ile Ala Ser Gly Leu Gly Phe Gln Met Ile Lys
65 70 75 80

Asp Ile Gly Tyr Ile Arg Thr Asp Leu Pro Glu Gly Phe Asp Phe Thr
85 90 95

Ile Ser Arg Ile Leu Glu Arg Ile Ile Ser Gly Ile Ala Ser His Trp
100 105 110

Thr Phe Ser Gly Leu Ala Val Val Gly Val Tyr Leu Leu Tyr Arg Ala
115 120 125

Tyr Lys Gly Gln Lys Val Gly Lys Lys Gln Gly Leu Ile Phe Leu Gly
130 135 140

Leu Ala Leu Gly Thr His Phe Leu Phe Asn Ser Pro Phe Val Glu Leu
145 150 155 160

Glu Thr Glu Leu Pro Leu Ala Ile Pro Val Val Thr Ala Ile Ala Leu
165 170 175

Tyr Gly Phe Tyr His Ala Tyr Cys Phe Val Glu Lys His Asn Glu Leu
180 185 190

Met Thr

<210> 137

<211> 129

<212> PRT

<213> Streptococcus pneumoniae

<400> 137

Met Lys Val Glu Pro Arg Cys Asp Val Leu Ser Arg Met Ser His Phe
1 5 10 15

109210 1846360

292

Phe Ile Arg Ile Leu Ile Met Glu Leu Gln Glu Leu Val Glu Arg Ser
20 25 30

Trp Ala Ile Arg Gln Ala Tyr His Glu Leu Glu Val Lys His His Asp
35 40 45

Ser Lys Trp Thr Val Glu Glu Asp Leu Leu Ala Leu Ser Asn Asp Ile
50 55 60

Gly Asn Phe Gln Arg Leu Val Met Thr Lys Gln Gly Arg Tyr Tyr Asp
65 70 75 80

Glu Thr Pro Tyr Thr Leu Glu Gln Lys Leu Ser Glu Asn Ile Trp Trp
85 90 95

Leu Leu Glu Leu Ser Gln Arg Leu Asp Ile Asp Ile Leu Thr Glu Met
100 105 110

Glu Asn Phe Leu Ser Asp Lys Glu Lys Gln Leu Asn Val Arg Thr Trp
115 120 125

Lys

<210> 138

<211> 324

<212> PRT

<213> Streptococcus pneumoniae

<400> 138

Met Leu Asp Trp Lys Gln Phe Phe Leu Ala Tyr Leu Arg Ser Arg Ser
1 5 10 15

Arg Leu Phe Ile Tyr Leu Leu Ser Leu Ala Phe Leu Val Leu Leu Phe
20 25 30

007597.01301

293

Gln Phe Leu Phe Ala Ser Leu Gly Ile Tyr Phe Leu Tyr Phe Phe Phe
35 40 45

Leu Cys Cys Phe Val Thr Ile Leu Phe Phe Thr Trp Asp Ile Leu Val
50 55 60

Glu Thr Gln Val Tyr Arg Gln Glu Leu Leu Tyr Gly Glu Arg Glu Ala
65 70 75 80

Lys Ser Pro Leu Glu Ile Ala Leu Ala Glu Lys Leu Glu Ala Arg Glu
85 90 95

Met Glu Leu Tyr Gln Gln Arg Ser Lys Ala Glu Arg Lys Leu Thr Asp
100 105 110

Leu Leu Asp Tyr Tyr Thr Leu Trp Val His Gln Ile Lys Thr Pro Ile
115 120 125

Ala Ala Ser Gln Leu Leu Val Ala Glu Val Val Asp Arg Gln Leu Lys
130 135 140

Gln Gln Leu Glu Gln Glu Ile Phe Lys Ile Asp Ser Tyr Thr Asn Leu
145 150 155 160

Val Leu Gln Tyr Leu Arg Leu Glu Ser Phe His Asp Asp Leu Val Leu
165 170 175

Lys Gln Val Gln Ile Glu Asp Leu Val Lys Glu Ile Ile Arg Lys Tyr
180 185 190

Ala Leu Phe Phe Ile Gln Lys Gly Leu Asn Val Asn Leu His Asp Leu
195 200 205

Asp Lys Glu Ile Val Thr Asp Lys Lys Trp Leu Leu Val Val Ile Glu
210 215 220

Gln Ile Ile Ser Asn Ser Leu Lys Tyr Thr Lys Glu Gly Gly Leu Glu
225 230 235 240

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294

Ile Tyr Met Asp Asp Gln Glu Leu Cys Ile Lys Asp Thr Gly Ile Gly
245 250 255

Ile Lys Asn Ser Asp Val Leu Arg Val Phe Glu Arg Gly Phe Ser Gly
260 265 270

Tyr Asn Gly Arg Leu Thr Gln Gln Ser Ser Gly Leu Gly Leu Tyr Leu
275 280 285

Ser Lys Lys Ile Ser Glu Glu Leu Gly His Gln Ile Arg Ile Glu Ser
290 295 300

Glu Val Gly Lys Gly Thr Thr Val Arg Ile Gln Phe Ala Gln Val Asn
305 310 315 320

Leu Val Leu Glu

<210> 139

<211> 195

<212> PRT

<213> Streptococcus pneumoniae

<400> 139

Met Glu Leu Asn Thr His Asn Ala Glu Ile Leu Leu Ser Ala Ala Asn
1 5 10 15

Lys Ser His Tyr Pro Gln Asp Glu Leu Pro Glu Ile Ala Leu Ala Gly
20 25 30

Arg Ser Asn Val Gly Lys Ser Ser Phe Ile Asn Thr Met Leu Asn Arg
35 40 45

Lys Asn Leu Ala Arg Thr Ser Gly Lys Pro Gly Lys Thr Gln Leu Leu
50 55 60

007697 04504

295

Asn Phe Phe Asn Ile Asp Asp Lys Met Arg Phe Val Asp Val Pro Gly
65 70 75 80

Tyr Gly Tyr Ala Arg Val Ser Lys Lys Glu Arg Glu Lys Trp Gly Cys
85 90 95

Met Ile Glu Glu Tyr Leu Thr Thr Arg Glu Asn Leu Arg Ala Val Val
100 105 110

Ser Leu Val Asp Leu Arg His Asp Pro Ser Ala Asp Asp Val Gln Met
115 120 125

Tyr Glu Phe Leu Lys Tyr Tyr Glu Ile Pro Val Ile Ile Val Ala Thr
130 135 140

Lys Ala Asp Lys Ile Pro Arg Gly Lys Trp Asn Lys His Glu Ser Ala
145 150 155 160

Ile Lys Lys Lys Leu Asn Phe Asp Pro Ser Asp Asp Phe Ile Leu Phe
165 170 175

Ser Ser Val Ser Lys Ala Gly Met Asp Glu Ala Trp Asp Ala Ile Leu
180 185 190

Glu Lys Leu
195

<210> 140

<211> 296

<212> PRT

<213> Streptococcus pneumoniae

<400> 140

Met Thr Lys Lys Gln Leu His Leu Val Ile Val Thr Gly Met Ser Gly
1 5 10 15

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296

Ala Gly Lys Thr Val Ala Ile Gln Ser Phe Glu Asp Leu Gly Tyr Phe
20 25 30

Thr Ile Asp Asn Met Pro Pro Ala Leu Leu Pro Lys Phe Leu Gln Leu
35 40 45

Val Glu Ile Lys Glu Asp Asn Pro Lys Leu Ala Leu Val Val Asp Met
50 55 60

Arg Ser Arg Ser Phe Phe Ser Glu Ile Gln Ala Val Leu Asp Glu Leu
65 70 75 80

Glu Asn Gln Asp Gly Leu Asp Phe Lys Ile Leu Phe Leu Asp Ala Ala
85 90 95

Asp Lys Glu Leu Val Ala Arg Tyr Lys Glu Thr Arg Arg Ser His Pro
100 105 110

Leu Ala Ala Asp Gly Arg Ile Leu Asp Gly Ile Lys Leu Glu Arg Glu
115 120 125

Leu Leu Ala Pro Leu Lys Asn Met Ser Gln Asn Val Val Asp Thr Thr
130 135 140

Glu Leu Thr Pro Arg Glu Leu Arg Lys Thr Leu Ala Glu Gln Phe Ser
145 150 155 160

Asp Gln Glu Gln Ala Gln Ser Phe Arg Ile Glu Val Met Ser Phe Gly
165 170 175

Phe Lys Tyr Gly Ile Pro Ile Asp Ala Asp Leu Val Phe Asp Val Arg
180 185 190

Phe Leu Pro Asn Pro Tyr Tyr Leu Pro Glu Leu Arg Asn Gln Thr Gly
195 200 205

Val Asp Glu Pro Val Tyr Asp Tyr Val Met Asn His Pro Glu Ser Glu
210 215 220

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297

Asp Phe Tyr Gln His Leu Leu Ala Leu Ile Glu Pro Ile Leu Pro Ser
225 230 235 240

Tyr Gln Lys Glu Gly Lys Ser Val Leu Thr Ile Ala Met Gly Cys Thr
245 250 255

Gly Gly Gln His Arg Ser Val Ala Phe Ala Lys Arg Leu Ala Gln Asp
260 265 270

Leu Ser Lys Asn Trp Ser Val Asn Glu Gly His Arg Asp Lys Asp Arg
275 280 285

Arg Lys Glu Thr Val Asn Arg Ser
290 295

<210> 141

<211> 325

<212> PRT

<213> Streptococcus pneumoniae

<400> 141

Met Arg Lys Pro Lys Ile Thr Val Ile Gly Gly Gly Thr Gly Ser Pro
1 5 10 15

Val Ile Leu Lys Ser Leu Arg Glu Lys Asp Val Glu Ile Ala Ala Ile
20 25 30

Val Thr Val Ala Asp Asp Gly Gly Ser Ser Gly Glu Leu Arg Lys Asn
35 40 45

Met Gln Gln Leu Thr Pro Pro Gly Asp Leu Arg Asn Val Leu Val Ala
50 55 60

Met Ser Asp Met Pro Lys Phe Tyr Glu Lys Val Phe Gln Tyr Arg Phe
65 70 75 80

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298

Ser Glu Asp Ala Gly Ala Phe Ala Gly His Pro Leu Gly Asn Leu Ile
85 90 95

Ile Ala Gly Leu Ser Glu Met Gln Gly Ser Thr Tyr Asn Ala Met Gln
100 105 110

Leu Leu Ser Lys Phe Phe His Thr Thr Gly Lys Ile Tyr Pro Ser Ser
115 120 125

Asp His Pro Leu Thr Leu His Ala Val Phe Gln Asp Gly Thr Glu Val
130 135 140

Ala Gly Glu Ser His Ile Val Asp His Arg Gly Ile Ile Asp Asn Val
145 150 155 160

Tyr Val Thr Asn Ala Leu Asn Asp Asp Thr Pro Leu Ala Ser Arg Arg
165 170 175

Val Val Gln Thr Ile Leu Glu Ser Asp Met Ile Val Leu Gly Pro Gly
180 185 190

Ser Leu Phe Thr Ser Ile Leu Pro Asn Ile Val Ile Lys Glu Ile Gly
195 200 205

Arg Ala Leu Leu Glu Thr Lys Ala Glu Ile Ala Tyr Val Cys Asn Ile
210 215 220

Met Thr Gln Arg Gly Glu Thr Glu His Phe Thr Asp Ser Asp His Val
225 230 235 240

Glu Val Leu His Arg His Leu Gly Arg Pro Phe Ile Asp Thr Val Leu
245 250 255

Val Asn Ile Glu Lys Val Pro Gln Glu Tyr Met Asn Ser Asn Arg Phe
260 265 270

Asp Glu Tyr Leu Val Gln Val Glu His Asp Phe Val Gly Leu Cys Lys
275 280 285

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299

Gln Val Ser Arg Val Ile Ser Ser Asn Phe Leu Arg Leu Glu Asn Gly
290 295 300

Gly Ala Phe His Asp Gly Asp Leu Ile Val Asp Glu Leu Met Arg Ile
305 310 315 320

Ile Gln Val Lys Lys
325

<210> 142

<211> 392

<212> PRT

<213> Streptococcus pneumoniae

<400> 142

Met Lys Asn Leu Ile Lys Leu Leu Ile Ile Arg Leu Ile Val Asn Leu
1 5 10 15

Ala Asp Ser Val Phe Tyr Ile Val Ala Leu Trp His Val Ser Asn Asn
20 25 30

Tyr Ser Ser Ser Met Phe Leu Gly Ile Phe Ile Ala Val Asn Tyr Leu
35 40 45

Pro Asp Leu Leu Leu Ile Phe Phe Gly Pro Val Ile Asp Arg Val Asn
50 55 60

Pro Gln Lys Ile Leu Ile Ile Ser Ile Leu Val Gln Leu Ala Val Ala
65 70 75 80

Val Ile Phe Leu Leu Leu Leu Asn Gln Ile Ser Phe Trp Val Ile Met
85 90 95

Ser Leu Val Phe Ile Ser Val Met Ala Ser Ser Ile Ser Tyr Val Ile
100 105 110

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300

Glu Asp Val Leu Ile Pro Gln Val Val Glu Tyr Asp Lys Ile Val Phe
115 120 125

Ala Asn Ser Leu Phe Ser Ile Ser Tyr Lys Val Leu Asp Ser Ile Phe
130 135 140

Asn Ser Phe Ala Ser Phe Leu Gln Val Ala Val Gly Phe Ile Leu Leu
145 150 155 160

Val Lys Ile Asp Ile Gly Ile Phe Leu Leu Ala Leu Phe Ile Leu Leu
165 170 175

Leu Leu Lys Phe Arg Thr Ser Asn Ala Asn Ile Glu Asn Phe Ser Phe
180 185 190

Lys Tyr Tyr Lys Arg Glu Val Leu Gln Gly Thr Lys Phe Ile Leu Asn
195 200 205

Asn Lys Leu Leu Phe Lys Thr Ser Ile Ser Leu Thr Leu Ile Asn Phe
210 215 220

Phe Tyr Ser Phe Gln Thr Val Val Val Pro Ile Phe Ser Ile Arg Tyr
225 230 235 240

Phe Asp Gly Pro Ile Phe Tyr Gly Ile Phe Leu Thr Ile Ala Gly Leu
245 250 255

Gly Gly Ile Leu Gly Asn Met Leu Ala Pro Ile Val Ile Lys Tyr Leu
260 265 270

Lys Ser Asn Gln Ile Val Gly Val Phe Leu Phe Leu Asn Gly Ser Ser
275 280 285

Trp Leu Val Ala Ile Val Ile Lys Asp Tyr Thr Leu Ser Leu Ile Leu
290 295 300

Phe Phe Val Cys Phe Met Ser Lys Gly Val Phe Asn Ile Ile Phe Asn
305 310 315 320

00369787 043604

301

Ser Leu Tyr Gln Gln Ile Pro Pro His Gln Leu Leu Gly Arg Val Asn
325 330 335

Thr Thr Ile Asp Ser Ile Ile Ser Phe Gly Met Pro Ile Gly Ser Leu
340 345 350

Val Ala Gly Thr Leu Ile Asp Leu Asn Ile Glu Leu Val Leu Ile Ala
355 360 365

Ile Ser Ile Pro Tyr Phe Leu Phe Ser Tyr Ile Phe Tyr Thr Asp Asn
370 375 380

Gly Leu Lys Glu Phe Ser Ile Tyr
385 390

<210> 143

<211> 225

<212> PRT

<213> Streptococcus pneumoniae

<400> 143

Met Met Ser Asn Lys Asn Lys Glu Ile Leu Ile Phe Ala Ile Leu Tyr
1 5 10 15

Thr Val Leu Phe Met Phe Asp Gly Val Lys Leu Leu Ala Ser Leu Met
20 25 30

Pro Ser Ala Ile Ala Asn Tyr Leu Val Tyr Val Val Leu Ala Leu Tyr
35 40 45

Gly Ser Phe Leu Phe Lys Asp Arg Leu Ile Gln Gln Trp Lys Glu Ile
50 55 60

Arg Lys Thr Lys Arg Lys Phe Phe Phe Gly Val Leu Thr Gly Trp Leu
65 70 75 80

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302

Phe Leu Ile Leu Met Thr Val Val Phe Glu Phe Val Ser Glu Met Leu
85 90 95

Lys Gln Phe Val Gly Leu Asp Gly Gln Gly Leu Asn Gln Ser Asn Ile
100 105 110

Gln Ser Thr Phe Gln Glu Gln Pro Leu Leu Ile Ala Val Phe Ala Cys
115 120 125

Val Ile Gly Pro Leu Val Glu Glu Leu Phe Phe Arg Gln Val Leu Leu
130 135 140

His Tyr Leu Gln Glu Arg Leu Ser Gly Leu Leu Ser Ile Ile Leu Val
145 150 155 160

Gly Leu Val Phe Ala Leu Thr His Met His Ser Leu Ala Leu Ser Glu
165 170 175

Trp Ile Gly Ala Val Gly Tyr Leu Gly Gly Gly Leu Ala Phe Ser Ile
180 185 190

Ile Tyr Val Lys Glu Lys Glu Asn Ile Tyr Tyr Pro Leu Leu Val His
195 200 205

Met Leu Ser Asn Ser Leu Ser Leu Ile Ile Leu Ala Ile Ser Ile Val
210 215 220

Lys
225

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<210> 144

<211> 385

<212> PRT

<213> Streptococcus pneumoniae

<400> 144

Leu Lys Lys Pro Ile Ile Glu Phe Lys Asn Val Ser Lys Val Phe Glu

1 5 10 15

Asp Ser Asn Thr Lys Val Leu Lys Asp Ile Asn Phe Glu Leu Glu Glu

20 25 30

Gly Lys Phe Tyr Thr Leu Leu Gly Ala Ser Gly Ser Gly Lys Ser Thr

35 40 45

Ile Leu Asn Ile Ile Ala Gly Leu Leu Asp Ala Thr Thr Gly Asp Ile

50 55 60

Met Leu Asp Gly Val Arg Ile Asn Asp Ile Pro Thr Asn Lys Arg Asp

65 70 75 80

Val His Thr Val Phe Gln Ser Tyr Ala Leu Phe Pro His Met Asn Val

85 90 95

Phe Glu Asn Val Ala Phe Pro Leu Arg Leu Arg Lys Ile Asp Lys Lys

100 105 110

Glu Ile Glu Gln Arg Val Ala Glu Val Leu Lys Met Val Gln Leu Glu

115 120 125

Gly Tyr Glu Lys Arg Ser Ile Arg Lys Leu Ser Gly Gly Gln Arg Gln

130 135 140

Arg Val Ala Ile Ala Arg Ala Ile Ile Asn Gln Pro Arg Val Val Leu

145 150 155 160

Leu Asp Glu Pro Leu Ser Ala Leu Asp Leu Lys Leu Arg Thr Asp Met

165 170 175

00769797 043504

304

Gln Tyr Glu Leu Arg Glu Leu Gln Gln Arg Leu Gly Ile Thr Phe Val
180 185 190

Phe Val Thr His Asp Gln Glu Glu Ala Leu Ala Met Ser Asp Trp Ile
195 200 205

Phe Val Met Asn Asp Gly Glu Ile Val Gln Ser Gly Thr Pro Val Asp
210 215 220

Ile Tyr Asp Glu Pro Ile Asn His Phe Val Ala Thr Phe Ile Gly Glu
225 230 235 240

Ser Asn Ile Leu Pro Gly Thr Met Ile Glu Asp Tyr Leu Val Glu Phe
245 250 255

Asn Gly Lys Arg Phe Glu Ala Val Asp Gly Gly Met Lys Pro Asn Glu
260 265 270

Pro Val Glu Val Val Ile Arg Pro Glu Asp Leu Arg Ile Thr Leu Pro
275 280 285

Glu Glu Gly Lys Leu Gln Val Lys Val Asp Thr Gln Leu Phe Arg Gly
290 295 300

Val His Tyr Glu Ile Ile Ala Tyr Asp Glu Leu Gly Asn Glu Trp Met
305 310 315 320

Ile His Ser Thr Arg Lys Ala Ile Val Gly Glu Glu Ile Gly Leu Asp
325 330 335

Phe Glu Pro Glu Asp Ile His Ile Met Arg Leu Asn Glu Thr Glu Glu
340 345 350

Glu Phe Asp Ala Arg Ile Glu Glu Tyr Val Glu Ile Glu Glu Gln Glu
355 360 365

Ala Gly Leu Ile Asn Ala Ile Glu Glu Glu Arg Asp Glu Glu Asn Lys
370 375 380

09769787 045604

Leu

385

<210> 145

<211> 206

<212> PRT

<213> Streptococcus pneumoniae

<400> 145

Met Lys Ser Met Arg Ile Leu Phe Leu Leu Ala Leu Ile Gln Ile Ser

1

5

10

15

Leu Ser Ser Cys Phe Leu Trp Lys Glu Cys Ile Leu Ser Phe Lys Gln

20

25

30

Ser Thr Ala Phe Phe Ile Gly Ser Met Val Phe Val Ser Gly Ile Cys

35

40

45

Ala Gly Val Asn Tyr Leu Tyr Thr Arg Lys Gln Glu Val His Ser Val

50

55

60

Leu Ala Ser Lys Lys Ser Val Lys Leu Phe Tyr Ser Met Leu Leu Leu

65

70

75

80

Ile Asn Leu Leu Gly Ala Val Leu Val Leu Ser Asp Asn Leu Phe Ile

85

90

95

Lys Asn Thr Leu Gln Gln Glu Leu Val Asp Phe Leu Leu Pro Ser Phe

100

105

110

Phe Phe Leu Phe Gly Leu Asp Leu Leu Ile Phe Leu Pro Leu Lys Lys

115

120

125

Tyr Val Arg Asp Phe Leu Ala Met Leu Asp Arg Lys Lys Thr Val Leu

130

135

140

P09697.2026566

[illegible]

Ile Leu Met Thr Val Asn Pro Lys Thr Lys Lys Thr Thr Met Met Ser
85 90 95

307

Leu Glu Arg Asp Ile Leu Thr Arg Ile Glu Ser Gly Asn Gly Gln Ala .
100 105 110

His Glu Ala Lys Leu Asn Ser Ala Tyr Ala Asp Gly Gly Ala Glu Leu
115 120 125

Ala Ile Glu Thr Ile Gln Lys Met Met Asn Ile His Ile Asp Arg Tyr
130 135 140

Val Met Val Asn Met Arg Gly Leu Gln Lys Leu Val Asp Ala Val Gly
145 150 155 160

Gly Ile Thr Val Asn Asn Ile Leu Gly Phe Pro Ile Ser Ile Ser Asp
165 170 175

Gln Glu Glu Phe Asn Thr Ile Ser Ile Gly Val Gly Glu Gln His Ile
180 185 190

Gly Gly Glu Glu Ala Leu Val Tyr Ala Arg Met Arg Tyr Gln Asp Pro
195 200 205

Glu Gly Asp Tyr Gly Arg Gln Lys Arg Gln Arg Glu Val Ile Gln Lys
210 215 220

Val Met Glu Lys Ala Leu Ser Leu Asn Ser Ile Gly His Tyr Gln Glu
225 230 235 240

Ile Leu Lys Ala Leu Ser Asp Asn Met Gln Thr Asn Ile Asp Leu Ser
245 250 255

Ala Lys Ser Ile Pro Asn Leu Leu Gly Tyr Lys Asp Ser Phe Lys Thr
260 265 270

Ile Glu Thr Gln Gln Leu Gln Gly Glu Gly Glu Ile Leu Gln Gly Val
275 280 285

Ser Tyr Gln Ile Val Ser Arg Ala His Met Leu Glu Met Gln Asn Leu
290 295 300

006070 01504

308

Leu Arg Arg Ser Leu Gly Gln Glu Glu Val Thr Gln Leu Glu Thr Asn
305 310 315 320

Ala Val Leu Phe Glu Asp Leu Phe Gly Arg Ala Pro Val Gly Asp Glu
325 330 335

Asp Asn

<210> 147

<211> 331

<212> PRT

<213> Streptococcus pneumoniae

<400> 147

Met Lys Lys Gln Ala Tyr Val Ile Ile Ala Leu Thr Ser Phe Leu Phe
1 5 10 15

Val Phe Phe Phe Ser His Ser Leu Leu Glu Ile Leu Asp Phe Asp Trp
20 25 30

Ser Ile Phe Leu His Asp Val Glu Lys Thr Glu Lys Phe Val Phe Leu
35 40 45

Leu Leu Val Phe Ser Met Ser Met Thr Cys Leu Leu Ala Leu Phe Trp
50 55 60

Arg Gly Ile Glu Glu Leu Ser Leu Arg Lys Met Gln Ala Asn Leu Lys
65 70 75 80

Arg Leu Leu Ala Gly Gln Glu Val Val Gln Val Ala Asp Pro Asp Leu
85 90 95

Asp Ala Ser Phe Lys Ser Leu Ser Gly Lys Leu Asn Leu Leu Thr Glu
100 105 110

09769787 013501

[illegible]

Met Ala Gly Thr Val Gln Leu Leu Thr Ala Pro Lys Gln Gly Leu Ala
305 310 315 320

310

Val Asp Ile Arg Ile Pro Leu Leu Asp Lys Glu

325

330

<210> 148

<211> 288

<212> PRT

<213> Streptococcus pneumoniae

<400> 148

Met Ile Val Ser Ile Ile Ser Gln Gly Phe Val Trp Ala Ile Leu Gly

1

5

10

15

Leu Gly Ile Phe Met Thr Phe Arg Ile Leu Asn Phe Pro Asp Met Thr

20

25

30

Thr Glu Gly Ser Phe Pro Leu Gly Gly Ala Val Ala Val Thr Leu Ile

35

40

45

Thr Lys Gly Val Asn Pro Phe Leu Ala Thr Leu Val Ala Val Gly Ala

50

55

60

Gly Cys Leu Ala Gly Met Ala Ala Gly Leu Leu Tyr Thr Lys Gly Lys

65

70

75

80

Ile Pro Thr Leu Leu Ser Gly Ile Leu Val Met Thr Ser Cys His Ser

85

90

95

Ile Met Leu Leu Ile Met Gly Arg Ala Asn Leu Gly Leu Leu Gly Thr

100

105

110

Lys Gln Ile Gln Asp Val Leu Pro Phe Asp Ser Asp Leu Asn Gln Leu

115

120

125

Leu Thr Gly Leu Ile Phe Val Ser Ile Val Ile Ala Leu Met Leu Phe

130

135

140

006973-01301

[illegible]

Met Lys Lys Met Lys Val Trp Ser Thr Val Leu Ala Thr Gly Val Ala
1 5 10 15

312

Leu Thr Thr Leu Ala Ala Cys Ser Gly Gly Ser Asn Ser Thr Thr Ala
20 25 30

Ser Ser Ser Glu Glu Lys Ala Asp Lys Ser Gln Glu Leu Val Ile Tyr
35 40 45

Ser Asn Ser Val Ser Asn Gly Arg Gly Asp Trp Leu Thr Ala Lys Ala
50 55 60

Lys Glu Ala Gly Phe Asn Ile Lys Met Val Asp Ile Ala Gly Ala Gln
65 70 75 80

Leu Ala Asp Arg Val Ile Ala Glu Lys Asn Asn Ala Val Ala Asp Met
85 90 95

Val Phe Gly Ile Gly Ala Val Asp Ser Asn Lys Ile Arg Asp Gln Lys
100 105 110

Leu Leu Val Gln Tyr Lys Pro Lys Trp Leu Asp Lys Ile Asp Gln Ser
115 120 125

Leu Ser Asp Lys Asp Asn Tyr Tyr Asn Pro Val Ile Val Gln Pro Leu
130 135 140

Val Leu Ile Gly Ala Pro Asp Val Lys Glu Met Pro Lys Asp Trp Thr
145 150 155 160

Glu Leu Gly Ser Lys Tyr Lys Gly Lys Tyr Ser Ile Ser Gly Leu Gln
165 170 175

Gly Gly Thr Gly Arg Ala Ile Leu Ala Ser Ile Leu Val Arg Tyr Leu
180 185 190

Asp Asp Lys Gly Glu Leu Gly Val Ser Glu Lys Gly Trp Glu Val Ala
195 200 205

Lys Glu Tyr Leu Lys Asn Ala Tyr Thr Leu Gln Lys Gly Glu Ser Ser
210 215 220

00769797 013604

313

Ile Val Lys Met Leu Asp Lys Glu Asp Pro Ile Gln Tyr Gly Met Met
225 230 235 240

Trp Gly Ser Gly Ala Leu Val Gly Gln Lys Glu Gln Asn Val Val Phe
245 250 255

Lys Val Met Thr Pro Glu Ile Gly Val Pro Phe Val Thr Glu Gln Thr
260 265 270

Met Val Leu Ser Thr Ser Lys Lys Gln Ala Leu Ala Lys Glu Phe Ile
275 280 285

Asp Trp Phe Gly Gln Ser Glu Ile Gln Val Glu Tyr Ser Lys Asn Phe
290 295 300

Gly Ser Ile Pro Ala Asn Lys Asp Ala Leu Lys Asp Leu Pro Glu Asp
305 310 315 320

Thr Lys Lys Phe Val Asp Gln Val Lys Pro Gln Asn Ile Asp Trp Glu
325 330 335

Ala Val Gly Lys His Leu Asp Glu Trp Val Glu Lys Ala Glu Leu Glu
340 345 350

Tyr Val Gln
355

<210> 150

<211> 336

<212> PRT

<213> Streptococcus pneumoniae

<400> 150

Met Ile Lys Phe Asp Asn Ile Gln Ile Lys Tyr Gly Asp Phe Val Ala
1 5 10 15

Gly Tyr Ile Glu Gln Val Gly Thr Pro Val Glu Ile Tyr His Asn Ser
210 215 220

315

Gln Thr Glu Phe Val Cys Asp Phe Ile Gly Asp Ile Asn Val Leu Thr
225 230 235 240

Asp Glu Thr Val His Glu Val Leu Leu Lys Asn Thr Ser Val Phe Leu
245 250 255

Glu Asp Lys Lys Gly Tyr Ile Arg Leu Glu Lys Val Arg Phe Asn Arg
260 265 270

Glu Thr Glu Gln Asp Phe Ile Leu Lys Gly Thr Ile Ile Asp Val Glu
275 280 285

Phe Ser Gly Val Thr Ile His Tyr Thr Ile Lys Val Ser Glu Ser Gln
290 295 300

Ile Leu Asn Val Thr Ser Ile Asp Ser Gln Ala Ala Ile Arg Ser Val
305 310 315 320

Gly Glu Ser Val Glu Leu Phe Ile Thr Pro Ser Asp Val Leu Gln Phe
325 330 335

<210> 151

<211> 563

<212> PRT

<213> Streptococcus pneumoniae

<400> 151

Met Arg His Lys Leu Asn Leu Lys Asp Trp Leu Ile Arg Leu Gly Leu
1 5 10 15

Ile Trp Phe Leu Val Thr Phe Ile Ile Tyr Pro Asn Phe Asp Leu Val
20 25 30

006939 01504

316

Val Asn Val Phe Val Lys Gly Gly Glu Phe Ser Leu Asp Ala Val His
35 40 45

Arg Val Leu Lys Ser Gln Arg Ala Leu Gln Ser Ile Met Asn Ser Phe
50 55 60

Lys Leu Ala Phe Ser Leu Ile Ile Thr Val Asn Val Val Gly Ile Leu
65 70 75 80

Cys Val Leu Phe Thr Glu Tyr Phe Asp Ile Lys Gly Ala Lys Ile Leu
85 90 95

Lys Leu Gly Tyr Met Thr Ser Leu Ile Tyr Gly Gly Val Val Leu Ala
100 105 110

Thr Gly Tyr Lys Phe Val Tyr Gly Pro Tyr Gly Leu Ile Thr Lys Phe
115 120 125

Leu Gln Asn Val Ile Pro Ser Leu Asp Pro Asn Trp Phe Ile Gly Tyr
130 135 140

Gly Ala Val Leu Phe Ile Met Thr Phe Ser Gly Thr Ala Asn His Thr
145 150 155 160

Leu Phe Leu Thr Asn Thr Ile Arg Ser Val Asp Tyr His Thr Ile Glu
165 170 175

Ala Ala Arg Asn Met Gly Ala Lys Pro Phe Thr Val Phe Arg Lys Val
180 185 190

Val Leu Pro Thr Leu Ile Pro Thr Leu Phe Ala Leu Thr Ile Met Val
195 200 205

Phe Leu Ser Gly Leu Ser Ala Val Ala Ala Pro Met Ile Val Gly Gly
210 215 220

Lys Glu Phe Gln Thr Ile Asn Pro Met Ile Ile Thr Phe Ala Gly Met
225 230 235 240

009697 013601

[illegible]

Leu Leu Ile Ala Tyr Ile Val Val Lys Ile Pro Phe Ser Tyr Arg Met
435 440 445

318

Val Arg Ala Ile Leu Phe Ser Val Asp Asp Glu Met Glu Asp Ala Ala
450 455 460

Arg Ser Met Gly Ala Ser Pro Phe Tyr Thr Met Met Lys Val Ile Ile
465 470 475 480

Pro Phe Ile Leu Pro Val Val Leu Ser Val Ile Ala Leu Asn Phe Asn
485 490 495

Ser Leu Leu Thr Asp Phe Asp Leu Ser Val Phe Leu Tyr His Pro Leu
500 505 510

Ala Gln Pro Leu Gly Ile Thr Ile Arg Ser Ala Gly Asp Glu Thr Ala
515 520 525

Thr Ser Asn Ala Gln Ala Leu Val Phe Val Tyr Thr Ile Val Leu Met
530 535 540

Ile Ile Ser Gly Thr Val Leu Tyr Phe Thr Gln Arg Pro Gly Arg Lys
545 550 555 560

Val Arg Lys

<210> 152

<211> 443

<212> PRT

<213> Streptococcus pneumoniae

<400> 152

Met Ile Lys Asn Pro Lys Leu Leu Thr Lys Ser Phe Leu Arg Ser Phe
1 5 10 15

Ala Ile Leu Gly Gly Val Gly Leu Val Ile His Ile Ala Ile Tyr Leu
20 25 30

00769730 04504

Gln Ile Val Lys Leu Gln Asn Gln Lys Val Ser Phe Val Arg Gly Ala
225 230 235 240

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Tyr Glu His Gly Met Glu Phe Lys Ile Ser Leu
435 440

<210> 153

<211> 290

<212> PRT

<213> Streptococcus pneumoniae

<400> 153

Met Asp Lys Ile Ile Lys Thr Ile Ser Glu Ser Gly Ala Phe Arg Ala

1 5 10 15

Phe Val Leu Asp Ser Thr Glu Thr Val Arg Thr Ala Gln Glu Lys His

20 25 30

Gln Thr Gln Ala Ser Ser Thr Val Ala Leu Gly Arg Thr Leu Ile Ala

35 40 45

Ser Gln Ile Leu Ala Ala Asn Glu Lys Gly Asn Thr Lys Leu Thr Val

50 55 60

Lys Val Leu Gly Ser Ser Ser Leu Gly Ala Ile Ile Thr Val Ala Asp

65 70 75 80

Thr Lys Gly Asn Val Lys Gly Tyr Val Gln Asn Pro Gly Val Asp Ile

85 90 95

Lys Lys Thr Ala Thr Gly Glu Val Leu Val Gly Pro Phe Val Gly Asn

100 105 110

Gly Gln Phe Leu Val Ile Thr Asp Tyr Gly Thr Gly Asn Pro Tyr Asn

115 120 125

Ser Ile Thr Pro Leu Ile Ser Gly Glu Ile Gly Glu Asp Leu Ala Phe

130 135 140

Tyr Leu Thr Glu Ser Gln Gln Thr Pro Ser Ala Val Gly Leu Asn Val

145 150 155 160

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322

Leu Leu Asp Glu Glu Asp Lys Val Lys Val Ala Gly Gly Phe Leu Val
165 170 175

Gln Val Leu Pro Gly Ala Lys Lys Glu Glu Ile Ala Arg Phe Glu Lys
180 185 190

Arg Ile Gln Glu Met Pro Ala Ile Ser Thr Leu Leu Glu Ser Asp Asp
195 200 205

His Ile Glu Ala Leu Leu Lys Ala Ile Tyr Gly Asp Glu Ala Tyr Lys
210 215 220

Arg Leu Ser Glu Glu Glu Ile Arg Phe Gln Cys Asp Cys Ser His Glu
225 230 235 240

Arg Phe Met Asn Ala Leu Ala Ser Leu Pro Ser Ser Asp Leu Gln Glu
245 250 255

Met Lys Glu Glu Asp His Gly Ala Glu Ile Thr Cys Gln Phe Cys Gln
260 265 270

Thr Thr Tyr Asn Phe Asp Glu Lys Asp Leu Glu Glu Leu Ile Arg Asp
275 280 285

Lys Ser
290

<210> 154

<211> 152

<212> PRT

<213> Streptococcus pneumoniae

<400> 154

Met Lys Ser Ile Thr Lys Lys Ile Lys Ala Thr Leu Ala Gly Val Ala
1 5 10 15

[illegible]

Ser Thr Tyr Thr Val Lys Glu Gly Asp Thr Leu Ser Glu Ile Ala Glu
35 40 45

Asn Ile His Leu Ile Tyr Val Asp Gln Glu Leu Val Ile Asp Gly Pro
65 70 75 80

Ala Gln Asp Glu Thr Val Ser Ala Pro Val Ala Glu Thr Pro Val Val
100 105 110

Ser Glu Thr Val Val Ser Thr Val Ser Gly Ser Glu Ala Glu Ala Lys
115 120 125

Glu Trp Ile Ala Gln Lys Glu Ser Gly Gly Ser Ile Gln Leu Gln Met
130 135 140

Asp Val Ile Ser Asp Val Thr Asn
145 150

<210> 155

<211> 677

<212> PRT

<213> Streptococcus pneumoniae

<400> 155

Met Asn Leu Gly Glu Phe Trp Tyr Asn Lys Ile Asn Lys Asn Arg Gly
1 5 10 15

Arg	Arg	Leu	Met	Lys	Lys	Val	Arg	Phe	Ile	Phe	Leu	Ala	Leu	Leu	Phe
20				25				30							
Phe	Leu	Ala	Ser	Pro	Glu	Gly	Ala	Met	Ala	Ser	Asp	Gly	Thr	Trp	Gln
35				40				45							
Gly	Lys	Gln	Tyr	Leu	Lys	Glu	Asp	Gly	Ser	Gln	Ala	Ala	Asn	Glu	Trp
50				55				60							
Val	Phe	Asp	Thr	His	Tyr	Gln	Ser	Trp	Phe	Tyr	Ile	Lys	Ala	Asp	Ala
65				70				75				80			
Asn	Tyr	Ala	Glu	Asn	Glu	Trp	Leu	Lys	Gln	Gly	Asp	Asp	Tyr	Phe	Tyr
85				90				95							
Leu	Lys	Ser	Gly	Gly	Tyr	Met	Ala	Lys	Ser	Glu	Trp	Val	Glu	Asp	Lys
100				105				110							
Gly	Ala	Phe	Tyr	Tyr	Leu	Asp	Gln	Asp	Gly	Lys	Met	Lys	Arg	Asn	Ala
115				120				125							
Trp	Val	Gly	Thr	Ser	Tyr	Val	Gly	Ala	Thr	Gly	Ala	Lys	Val	Ile	Glu
130				135				140							
Asp	Trp	Val	Tyr	Asp	Ser	Gln	Tyr	Asp	Ala	Trp	Phe	Tyr	Ile	Lys	Ala
145				150				155				160			
Asp	Gly	Gln	His	Ala	Glu	Lys	Glu	Trp	Leu	Gln	Ile	Lys	Gly	Lys	Asp
165				170				175							
Tyr	Tyr	Phe	Lys	Ser	Gly	Gly	Tyr	Leu	Leu	Thr	Ser	Gln	Trp	Ile	Asn
180				185				190							
Gln	Ala	Tyr	Val	Asn	Ala	Ser	Gly	Ala	Lys	Val	Gln	Gln	Gly	Trp	Leu
195				200				205							
Phe	Asp	Lys	Gln	Tyr	Gln	Ser	Trp	Phe	Tyr	Ile	Lys	Glu	Asn	Gly	Asn
210				215				220							

325

Tyr Ala Asp Lys Glu Trp Ile Phe Glu Asn Gly His Tyr Tyr Tyr Leu
225 230 235 240

Lys Ser Gly Gly Tyr Met Ala Ala Asn Glu Trp Ile Trp Asp Lys Glu
245 250 255

Ser Trp Phe Tyr Leu Lys Phe Asp Gly Lys Met Ala Glu Lys Glu Trp
260 265 270

Val Tyr Asp Ser His Ser Gln Ala Trp Tyr Tyr Phe Lys Ser Gly Gly
275 280 285

Tyr Met Thr Ala Asn Glu Trp Ile Trp Asp Lys Glu Ser Trp Phe Tyr
290 295 300

Leu Lys Ser Asp Gly Lys Ile Ala Glu Lys Glu Trp Val Tyr Asp Ser
305 310 315 320

His Ser Gln Ala Trp Tyr Tyr Phe Lys Ser Gly Gly Tyr Met Thr Ala
325 330 335

Asn Glu Trp Ile Trp Asp Lys Glu Ser Trp Phe Tyr Leu Lys Ser Asp
340 345 350

Gly Lys Ile Ala Glu Lys Glu Trp Val Tyr Asp Ser His Ser Gln Ala
355 360 365

Trp Tyr Tyr Phe Lys Ser Gly Gly Tyr Met Ala Lys Asn Glu Thr Val
370 375 380

Asp Gly Tyr Gln Leu Gly Ser Asp Gly Lys Trp Leu Gly Gly Lys Thr
385 390 395 400

Thr Asn Glu Asn Ala Ala Tyr Tyr Gln Val Val Pro Val Thr Ala Asn
405 410 415

Val Tyr Asp Ser Asp Gly Glu Lys Leu Ser Tyr Ile Ser Gln Gly Ser
420 425 430

00759797 012501

Ala Thr Lys Trp Ile Lys Glu Asn Tyr Ile Asp Arg Gly Arg Thr Phe
625 630 635 640

327

Leu Gly Asn Lys Ala Ser Gly Met Asn Val Glu Tyr Ala Ser Asp Pro
645 650 655

Tyr Trp Gly Glu Lys Ile Ala Ser Val Met Met Lys Ile Asn Glu Lys
660 665 670

Leu Gly Gly Lys Asp
675

<210> 156

<211> 309

<212> PRT

<213> Streptococcus pneumoniae

<400> 156

Met Lys Lys Leu Gly Thr Leu Leu Val Leu Phe Leu Ser Ala Ile Ile
1 5 10 15

Leu Val Ala Cys Ala Ser Gly Lys Lys Asp Thr Thr Ser Gly Gln Lys
20 25 30

Leu Lys Val Val Ala Thr Asn Ser Ile Ile Ala Asp Ile Thr Lys Asn
35 40 45

Ile Ala Gly Asp Lys Ile Asp Leu His Ser Ile Val Pro Ile Gly Gln
50 55 60

Asp Pro His Glu Tyr Glu Pro Leu Pro Glu Asp Val Lys Lys Thr Ser
65 70 75 80

Glu Ala Asn Leu Ile Phe Tyr Asn Gly Ile Asn Leu Glu Thr Gly Gly
85 90 95

Asn Ala Trp Phe Thr Lys Leu Val Glu Asn Ala Lys Lys Thr Glu Asn
100 105 110

0076937 013604
1099210 15669260

328

Lys Asp Tyr Phe Ala Val Ser Asp Gly Val Asp Val Ile Tyr Leu Glu
115 120 125

Gly Gln Asn Glu Lys Gly Lys Glu Asp Pro His Ala Trp Leu Asn Leu
130 135 140

Glu Asn Gly Ile Ile Phe Ala Lys Asn Ile Ala Lys Gln Leu Ser Ala
145 150 155 160

Lys Asp Pro Asn Asn Lys Glu Phe Tyr Glu Lys Asn Leu Lys Glu Tyr
165 170 175

Thr Asp Lys Leu Asp Lys Leu Asp Lys Glu Ser Lys Asp Lys Phe Asn
180 185 190

Lys Ile Pro Ala Glu Lys Lys Leu Ile Val Thr Ser Glu Gly Ala Phe
195 200 205

Lys Tyr Phe Ser Lys Ala Tyr Gly Val Pro Ser Ala Tyr Ile Trp Glu
210 215 220

Ile Asn Thr Glu Glu Glu Gly Thr Pro Glu Gln Ile Lys Thr Leu Val
225 230 235 240

Glu Lys Leu Arg Gln Thr Lys Val Pro Ser Leu Phe Val Glu Ser Ser
245 250 255

Val Asp Asp Arg Pro Met Lys Thr Val Ser Gln Asp Thr Asn Ile Pro
260 265 270

Ile Tyr Ala Gln Ile Phe Thr Asp Ser Ile Ala Glu Gln Gly Lys Glu
275 280 285

Gly Asp Ser Tyr Tyr Ser Met Met Lys Tyr Asn Leu Asp Lys Ile Ala
290 295 300

Glu Gly Leu Ala Lys
305

003697 01604

<210> 157

<211> 419

<212> PRT

<213> Streptococcus pneumoniae

<400> 157

Met Glu Trp Tyr Lys Lys Ile Gly Leu Leu Ala Thr Thr Gly Leu Ala
 1 5 10 15

Leu Phe Gly Leu Gly Ala Cys Ser Asn Tyr Gly Lys Ser Ala Asp Gly
 20 25 30

Thr Val Thr Ile Glu Tyr Phe Asn Gln Lys Lys Glu Met Thr Lys Thr
 35 40 45

Leu Glu Glu Ile Thr Arg Asp Phe Glu Lys Glu Asn Pro Lys Ile Lys
 50 55 60

Val Lys Val Val Asn Val Pro Asn Ala Gly Glu Val Leu Lys Thr Arg
 65 70 75 80

Val Leu Ala Gly Asp Val Pro Asp Val Val Asn Ile Tyr Pro Gln Ser
 85 90 95

Ile Glu Leu Gln Glu Trp Ala Lys Ala Gly Val Phe Glu Asp Leu Ser
 100 105 110

Asn Lys Asp Tyr Leu Lys Arg Val Lys Asn Gly Tyr Ala Glu Lys Tyr
 115 120 125

Ala Val Asn Glu Lys Val Tyr Asn Val Pro Phe Thr Ala Asn Ala Tyr
 130 135 140

Gly Ile Tyr Tyr Asn Lys Asp Lys Phe Glu Glu Leu Gly Leu Lys Val
 145 150 155 160

005697 01501
 105210 1663260

330

Pro Glu Thr Trp Asp Glu Phe Glu Gln Leu Val Lys Asp Ile Val Ala
165 170 175

Lys Gly Gln Thr Pro Phe Gly Ile Ala Gly Ala Asp Ala Trp Thr Leu
180 185 190

Asn Gly Tyr Asn Gln Leu Ala Phe Ala Thr Ala Thr Gly Gly Gly Lys
195 200 205

Glu Ala Asn Gln Tyr Leu Arg Tyr Ser Gln Pro Asn Ala Ile Lys Leu
210 215 220

Ser Asp Pro Ile Met Lys Asp Asp Ile Lys Val Met Asp Ile Leu Arg
225 230 235 240

Ile Asn Gly Ser Lys Gln Lys Asn Trp Glu Gly Ala Gly Tyr Thr Asp
245 250 255

Val Ile Gly Ala Phe Ala Arg Gly Asp Val Leu Met Thr Pro Asn Gly
260 265 270

Ser Trp Ala Ile Thr Ala Ile Asn Glu Gln Lys Pro Asn Phe Lys Ile
275 280 285

Gly Thr Phe Met Ile Pro Gly Lys Glu Lys Gly Gln Ser Leu Thr Val
290 295 300

Gly Ala Gly Asp Leu Ala Trp Ser Ile Ser Ala Thr Thr Lys His Pro
305 310 315 320

Lys Glu Ala Asn Ala Phe Val Glu Tyr Met Thr Arg Pro Glu Val Met
325 330 335

Gln Lys Tyr Tyr Asp Val Asp Gly Ser Pro Thr Ala Ile Glu Gly Val
340 345 350

Lys Gln Ala Gly Glu Asp Ser Pro Leu Ala Gly Met Thr Glu Tyr Ala
355 360 365

00369707-043604

[illegible]

Phe Val Leu Tyr Pro Thr Ala His Thr Asp Tyr Ser Val Lys Val Ser
85 90 95

332

Pro Trp Arg Arg Gly Lys Gly Asp Leu Leu Leu Glu Val Ser Gln Ala
100 105 110

Ala Thr Glu Phe Asp Met Asp Met Gly Val Tyr Leu Ser Pro Trp Asp
115 120 125

Ala His Ser Pro Leu Tyr His Val Asp Arg Glu Ala Asp Tyr Asn Ala
130 135 140

Tyr Tyr Leu Ala Gln Leu Lys Glu Ile Leu Ser Asn Pro Asn Tyr Gly
145 150 155 160

Asn Ala Gly Lys Phe Ala Glu Val Trp Met Asp Gly Ala Arg Gly Glu
165 170 175

Gly Ala Gln Lys Val Asn Tyr Glu Phe Glu Lys Trp Phe Glu Thr Ile
180 185 190

Arg Asp Leu Gln Gly Asp Cys Leu Ile Phe Ser Thr Glu Gly Thr Ser
195 200 205

Ile Arg Trp Ile Gly Asn Glu Arg Gly Tyr Ala Gly Asp Pro Leu Trp
210 215 220

Gln Lys Val Asn Pro Asp Lys Leu Gly Thr Glu Ala Glu Leu Asn Tyr
225 230 235 240

Leu Gln His Gly Asp Pro Ser Gly Thr Ile Phe Ser Ile Gly Glu Ala
245 250 255

Asp Val Ser Ile Arg Pro Gly Trp Phe Tyr His Glu Asp Gln Asp Pro
260 265 270

Lys Ser Leu Glu Glu Leu Val Glu Ile Tyr Phe His Ser Val Gly Arg
275 280 285

Gly Thr Pro Leu Leu Leu Asn Ile Pro Pro Asn Gln Ala Gly Leu Phe
290 295 300

109270 666660

[illegible]

Gln Pro Gly Thr Gly Val His Gly Val Ala Tyr Gln Asp Glu Ile Gln
500 505 510

334

Val Leu Ala Phe Gln Thr Gly Glu Thr Glu Lys Ser Leu Thr Leu Pro
515 520 525

Thr Leu Tyr Phe Ala Gly Asp Lys Thr Leu Asp Phe Tyr Leu Asn Leu
530 535 540

Thr Val Asp Gly Gln Leu Val Asp Gln Leu Gln Val Gln Val Ser
545 550 555

<210> 159

<211> 227

<212> PRT

<213> Streptococcus pneumoniae

<400> 159

Met Leu Glu Arg Leu Lys Arg Ile His Tyr Met Phe Trp Ile Ser Leu
1 5 10 15

Ile Phe Met Ile Phe Pro Ile Leu Ser Val Val Thr Gly Trp Leu Ser
20 25 30

Ala Trp His Leu Leu Ile Asp Ile Leu Phe Val Val Ala Tyr Leu Gly
35 40 45

Val Leu Thr Thr Lys Ser Gln Arg Leu Ser Trp Leu Tyr Trp Gly Leu
50 55 60

Met Leu Thr Tyr Val Val Gly Asn Thr Ala Phe Val Ala Val Asn Tyr
65 70 75 80

Ile Trp Phe Phe Phe Phe Leu Ser Asn Leu Leu Ser Tyr His Phe Ser
85 90 95

Val Arg Ser Leu Lys Ser Leu His Val Trp Thr Phe Leu Leu Ala Gln
100 105 110

09260797.043604

335

Val Leu Val Val Gly Gln Leu Leu Ile Phe Gln Arg Ile Glu Val Glu
115 120 125

Phe Leu Phe Tyr Leu Leu Val Ile Leu Thr Phe Val Asp Leu Met Thr
130 135 140

Phe Gly Leu Val Arg Ile Arg Ile Val Glu Asp Leu Lys Glu Ala Gln
145 150 155 160

Val Lys Gln Asn Ala Gln Ile Asn Leu Leu Leu Ala Glu Asn Glu Arg
165 170 175

Ser Arg Ile Gly Gln Asp Leu His Asp Ser Leu Gly His Thr Phe Ala
180 185 190

Met Leu Ser Val Lys Thr Asp Leu Ala Leu Gln Leu Phe Gln Met Glu
195 200 205

Ala Tyr Pro Gln Val Glu Lys Glu Leu Lys Glu Ile His Gln Ile Ser
210 215 220

Lys Asp Pro
225

<210> 160

<211> 370

<212> PRT

<213> Streptococcus pneumoniae

<400> 160

Met Asn Asp Lys Leu Lys Ile Phe Leu Leu Leu Gly Val Phe Phe Leu
1 5 10 15

Ala Ile Thr Gly Phe Tyr Val Leu Leu Ile Arg Asn Ala Gly Gln Thr
20 25 30

09769707 043604

Asp Ala Ser Gln Ile Glu Lys Ala Ala Val Ser Gln Gly Gly Lys Ala
35 40 45

Val Lys Lys Thr Glu Ile Ser Lys Asp Ala Asp Leu His Glu Ile Tyr
50 55 60

Leu Ala Gly Gly Cys Phe Trp Gly Val Glu Glu Tyr Phe Ser Arg Val
65 70 75 80

Pro Gly Val Thr Asp Ala Val Ser Gly Tyr Ala Asn Gly Arg Gly Glu
85 90 95

Thr Thr Lys Tyr Glu Leu Ile Asn Gln Thr Gly His Ala Glu Thr Val
100 105 110

His Val Thr Tyr Asp Ala Lys Gln Ile Ser Leu Lys Glu Ile Leu Leu
115 120 125

His Tyr Phe Arg Ile Ile Asn Pro Thr Ser Lys Asn Lys Gln Gly Asn
130 135 140

Asp Val Gly Thr Gln Tyr Arg Thr Gly Val Tyr Tyr Thr Asp Asp Lys
145 150 155 160

Asp Leu Glu Val Ile Asn Gln Val Phe Asp Glu Val Ala Lys Lys Tyr
165 170 175

Asp Gln Pro Leu Ala Val Glu Lys Glu Asn Leu Lys Asn Phe Val Val
180 185 190

Ala Glu Asp Tyr His Gln Asp Tyr Leu Lys Lys Asn Pro Asn Gly Tyr
195 200 205

Cys His Ile Asn Val Asn Gln Ala Ala Tyr Pro Val Ile Asp Ala Ser
210 215 220

Lys Tyr Pro Lys Pro Ser Asp Glu Glu Leu Lys Lys Thr Leu Ser Pro
225 230 235 240

00369797.043604

337

Glu Glu Tyr Ala Val Thr Gln Glu Asn Gln Thr Glu Arg Ala Phe Ser
245 250 255

Asn Arg Tyr Trp Asp Lys Phe Glu Ser Gly Ile Tyr Val Asp Ile Ala
260 265 270

Thr Gly Glu Pro Leu Phe Ser Ser Lys Asp Lys Phe Glu Ser Gly Cys
275 280 285

Gly Trp Pro Ser Phe Thr Gln Pro Ile Ser Pro Asp Val Val Thr Tyr
290 295 300

Lys Glu Asp Lys Ser Tyr Asn Met Thr Arg Met Glu Val Arg Ser Arg
305 310 315 320

Val Gly Asp Ser His Leu Gly His Val Phe Thr Asp Gly Pro Gln Asp
325 330 335

Lys Gly Gly Leu Arg Tyr Cys Ile Asn Ser Leu Ser Ile Arg Phe Ile
340 345 350

Pro Lys Asp Gln Met Glu Glu Lys Gly Tyr Ala Tyr Leu Leu Asp Tyr
355 360 365

Val Asp
370

<210> 161

<211> 338

<212> PRT

<213> Streptococcus pneumoniae

<400> 161

Met Lys Lys Lys Trp Met Tyr Tyr Ala Ala Cys Ser Ser Asn Glu Ser
1 5 10 15

338

Ala Asp Asp Ser Ser Ser Asp Lys Gly Asp Gly Gly Ser Leu Val Val
20 25 30

Tyr Ser Pro Asn Ser Glu Gly Leu Ile Gly Ala Thr Ile Pro Ala Phe
35 40 45

Glu Glu Lys Tyr Gly Ile Lys Val Glu Leu Ile Gln Ala Gly Thr Gly
50 55 60

Glu Leu Phe Lys Lys Leu Glu Ser Glu Lys Glu Val Pro Val Ala Asp
65 70 75 80

Val Ile Phe Gly Gly Ser Tyr Thr Gln Tyr Thr Thr His Gly Glu Leu
85 90 95

Phe Glu Asn Tyr Thr Ser Lys Glu Asn Asp Asn Val Ile Lys Glu Tyr
100 105 110

Gln Asn Thr Thr Gly Tyr Ser Thr Pro Tyr Thr Leu Asp Gly Ser Val
115 120 125

Leu Ile Val Asn Pro Asp Leu Thr Lys Gly Met Asn Ile Glu Gly Tyr
130 135 140

Asn Asp Leu Phe Lys Pro Glu Leu Lys Gly Lys Ile Ala Thr Ala Asp
145 150 155 160

Pro Ala Asn Ser Ser Ser Ala Phe Ala Gln Leu Thr Asn Met Leu Gln
165 170 175

Ala Gln Gly Gly Tyr Lys Asp Asp Lys Ala Trp Ser Tyr Val Lys Asp
180 185 190

Leu Phe Thr Leu Ile Asp Gly Lys Ile Gly Ser Ser Ser Ser Ser Val
195 200 205

Tyr Lys Val Val Ala Asp Gly Glu Met Ala Val Gly Leu Ser Tyr Glu
210 215 220

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341

Pro Ala Asn Leu Glu Lys Arg Ser Asp Gly Ala Tyr Ile Val Phe Ser
245 250 255

Asp Gly Tyr Ala Leu Arg Met Pro Ala Leu Asp Gln Val Glu Glu Gln
260 265 270

Ala Ile His Val Ser Ile Arg Pro Glu Glu Phe Ile Lys Asp Glu Ser
275 280 285

Gly Asp Ile Glu Gly Thr Ile Arg Asp Ser Val Tyr Leu Gly Leu Asn
290 295 300

Thr Asp Tyr Phe Ile Glu Thr Gly Phe Ala Ser Lys Ile Gln Val Ser
305 310 315 320

Glu Glu Ser Thr Phe Glu Glu Asp Leu Gln Lys Gly Asn Arg Ile Arg
325 330 335

Leu Arg Ile Asn Thr Gln Lys Leu Asn Ile Phe Ser Ala Asp Gly Ser
340 345 350

Gln Asn Leu Ile Lys Gly Val Asn His Gly Thr
355 360

<210> 163

<211> 313

<212> PRT

<213> Streptococcus pneumoniae

<400> 163

Met Lys Lys Lys Leu Leu Ala Gly Ala Ile Thr Leu Leu Ser Val Ala
1 5 10 15

Thr Leu Ala Ala Cys Ser Lys Gly Ser Glu Gly Ala Asp Leu Ile Ser
20 25 30

09769797.042604

343

Lys Lys Thr Glu Lys Ser Ser Asn Ile Asp Asp Tyr Lys Glu Lys Leu
245 250 255

Lys Thr Val Ile Leu Thr Gln Lys Gln Asn Asp Ser Thr Phe Val Gln
260 265 270

Ser Ile Ile Gly Lys Glu Leu Gln Ala Ala Asn Ile Lys Val Lys Asp
275 280 285

Gln Ala Phe Gln Asn Ile Phe Thr Gln Tyr Ile Gly Gly Gly Asp Ser
290 295 300

Ser Ser Ser Ser Ser Thr Ser Asn Glu
305 310

<210> 164

<211> 465

<212> PRT

<213> Streptococcus pneumoniae

<400> 164

Met Lys Lys Asn Ile Lys Gln Tyr Val Thr Leu Gly Thr Val Val Val
1 5 10 15

Leu Ser Ala Phe Val Ala Asn Ser Val Ala Ala Gln Glu Thr Glu Thr
20 25 30

Ser Glu Val Ser Thr Pro Lys Leu Val Gln Pro Val Ala Pro Thr Thr
35 40 45

Pro Ile Ser Glu Val Gln Pro Thr Ser Asp Asn Ser Ser Glu Val Thr
50 55 60

Val Gln Pro Arg Thr Val Glu Thr Thr Val Lys Asp Pro Ser Ser Thr
65 70 75 80

00929 1326360

344

Ala Glu Glu Thr Pro Val Leu Glu Lys Asn Asn Val Thr Leu Thr Gly
85 90 95

Gly Gly Glu Asn Val Thr Lys Glu Leu Lys Asp Lys Phe Thr Ser Gly
100 105 110

Asp Phe Thr Val Val Ile Lys Tyr Asn Gln Ser Ser Glu Lys Gly Leu
115 120 125

Gln Ala Leu Phe Gly Ile Ser Asn Ser Lys Pro Gly Gln Gln Asn Ser
130 135 140

Tyr Val Asp Val Phe Leu Arg Asp Asn Gly Glu Leu Gly Met Glu Ala
145 150 155 160

Arg Asp Thr Ser Ser Asn Lys Asn Asn Leu Val Ser Arg Pro Ala Ser
165 170 175

Val Trp Gly Lys Tyr Lys Gln Glu Ala Val Thr Asn Thr Val Ala Val
180 185 190

Val Ala Asp Ser Val Lys Lys Thr Tyr Ser Leu Tyr Ala Asn Gly Thr
195 200 205

Lys Val Val Glu Lys Lys Val Asp Asn Phe Leu Asn Ile Lys Asp Ile
210 215 220

Lys Gly Ile Asp Tyr Tyr Met Leu Gly Gly Val Lys Arg Ala Gly Lys
225 230 235 240

Thr Ala Phe Gly Phe Asn Gly Thr Leu Glu Asn Ile Lys Phe Phe Asn
245 250 255

Ser Ala Leu Asp Glu Glu Thr Val Lys Lys Met Thr Thr Asn Ala Val
260 265 270

Thr Gly His Leu Ile Tyr Thr Ala Asn Asp Thr Thr Gly Ser Asn Tyr
275 280 285

FOIA b 7 - D

<210> 165

<211> 266

<212> PRT

<213> Streptococcus pneumoniae

<400> 165

Met Lys Lys Phe Ser Leu Leu Leu Ala Ile Leu Pro Phe Leu Val Ala

1

5

10

15

Cys Glu Asn Gln Ala Thr Pro Lys Glu Thr Ser Ala Gln Lys Thr Ile

20

25

30

Val Leu Ala Thr Ala Gly Asp Val Pro Pro Phe Asp Tyr Glu Asp Lys

35

40

45

Gly Asn Leu Thr Gly Phe Asp Ile Glu Val Leu Lys Ala Val Asp Glu

50

55

60

Lys Leu Ser Asp Tyr Glu Ile Gln Phe Gln Arg Thr Ala Trp Glu Ser

65

70

75

80

Ile Phe Pro Gly Leu Asp Ser Gly His Tyr Gln Ala Ala Ala Asn Asn

85

90

95

Leu Ser Tyr Thr Lys Glu Arg Ala Glu Lys Tyr Leu Tyr Ser Leu Pro

100

105

110

Ile Ser Asn Asn Pro Leu Val Leu Val Ser Asn Lys Lys Asn Pro Leu

115

120

125

Thr Ser Leu Asp Gln Ile Ala Gly Lys Thr Thr Gln Glu Asp Thr Gly

130

135

140

Thr Ser Asn Ala Gln Phe Ile Asn Asn Trp Asn Gln Lys His Thr Asp

145

150

155

160

Asn Pro Ala Thr Ile Asn Phe Ser Gly Glu Asp Ile Gly Lys Arg Ile

165

170

175

105607 01501

347

Leu Asp Leu Ala Asn Gly Glu Phe Asp Phe Leu Val Phe Asp Lys Val
180 185 190

Ser Val Gln Lys Ile Ile Lys Asp Arg Gly Leu Asp Leu Ser Val Val
195 200 205

Asp Leu Pro Ser Ala Asp Ser Pro Ser Asn Tyr Ile Ile Phe Ser Ser
210 215 220

Asp Gln Lys Glu Phe Lys Glu Gln Phe Asp Lys Ala Leu Lys Glu Leu
225 230 235 240

Tyr Gln Asp Gly Thr Leu Glu Lys Leu Ser Asn Thr Tyr Leu Gly Gly
245 250 255

Ser Tyr Leu Pro Asp Gln Ser Gln Leu Gln
260 265

<210> 166

<211> 259

<212> PRT

<213> Streptococcus pneumoniae

<400> 166

Met Lys Lys Asn Ser Leu Tyr Ile Ile Ser Ser Leu Phe Phe Ala Cys
1 5 10 15

Val Leu Phe Val Tyr Ala Thr Ala Thr Asn Phe Gln Asn Ser Thr Ser
20 25 30

Ala Arg Gln Val Lys Thr Glu Thr Tyr Thr Asn Thr Val Thr Asn Val
35 40 45

Pro Ile Asp Ile Arg Tyr Asn Ser Asp Lys Tyr Phe Ile Ser Gly Phe
50 55 60

Figure 1 displays 12 histograms, labeled (a) through (l), representing the distribution of the number of non-zero elements in the vector x_k for $k = 0, 1, \dots, 11$. The x-axis for all histograms is 'Number of non-zero elements' (0 to 10), and the y-axis is 'Frequency' (0 to 10). The distributions are roughly bell-shaped and centered around 5-6 non-zero elements.

Lys Thr Asn

<211> 263

<213> Streptococcus pneumoniae

Met Leu Ile Gly Glu Gly Tyr Arg Thr Phe Pro Val Leu Ile Tyr Thr

1 5 10 15

Gln Phe Ile Ser Glu Val Gly Gly Asn Ser Ala Phe Ala Ile Met Ala

20 25 30

Ile Ile Ile Ala Leu Ala Ile Phe Leu Ile Gln Lys His Ile Ala Asn

35 40 45

Arg Tyr Ser Phe Ser Met Asn Leu Leu His Pro Ile Glu Pro Lys Lys

50 **55** **60**

Thr Thr Lys Gly Lys Met Ala Ala Ile Tyr Ala Thr Val Tyr Gly Ile

65 70 75 80

Ile Phe Ile Ser Val Leu Pro Gln Ile Tyr Leu Ile Tyr Thr Ser Phe

85 90 95

Leu Lys Thr Ser Gly Met Val Ser Val Lys Gly Tyr Ser Pro Asn Ser

100 105 110

Tyr Lys Val Ala Phe His Arg Met Gly Ser Ala Ile Phe Asn Thr Ile

115 120 125

Arg Ile Pro Leu Ile Ala Leu Val Leu Val Val Leu Phe Ala Thr Phe

130 135 140

Ile Ser Tyr Leu Ala Val Arg Lys Arg Asn Leu Phe Thr Asn Leu Ile

145 150 155 160

350

Asp Ser Leu Ser Met Val Pro Tyr Ile Val Pro Gly Thr Val Leu Gly
165 170 175

Ile Ala Phe Ile Ser Ser Phe Asn Thr Gly Leu Phe Gly Ser Gly Phe
180 185 190

Leu Met Ile Thr Gly Thr Ala Phe Ile Leu Ile Met Ser Leu Ser Ala
195 200 205

Arg Arg Leu Pro Tyr Thr Ile Arg Ser Ser Val Ala Ser Leu Gln Gln
210 215 220

Ile Ala Pro Ser Ile Glu Glu Ala Ala Glu Ser Leu Gly Ser Ser Arg
225 230 235 240

Leu Asn Thr Phe Ala Lys Ile Thr Thr Pro Met Met Leu Ser Gly Ile
245 250 255

Ile Ser Gly Ala Ile Leu Ser
260

<210> 168

<211> 1332

<212> DNA

<213> Streptococcus pneumoniae

<400> 168

atgataaaaa atcctaaatt attaaccaag tcttttttaa gaagttttgc aattctaggt 60
ggtgttggtc tagtcattca tatagctatt tatttgacct ttccttttta ttatattcaa 120
ctggagggggg aaaagtttaa tgagagcgca agagtgttta cggagtattt aaagactaag 180
acatctgatg aaattccaag cttactccag tcttattcaa agtccttgac catatctgct 240
caccttaaaa gagatattgt agataagcgg ctccctcttg tgcattgactt ggatattaaa 300
gatggaaagc tatcaaatta tatcgtgatg ttagatatgt ctgttagtac agcagatggg 360
aaacaggtaa ccgtgcaatt tgttcacggg gtggatgtct acaaagaagc aaagaatatt 420
ttgcttttgt atctcccata tacatttttg gttacaattg ctttttcctt tgttttttct 480
tatttttata ctaaacgctt gctcaatcct cttttttaca tttcagaagt gactagtaaa 540

atgcaagatt tggatgacaa tattogtttt gatgaaagta ggaaagatga agttggtgaa 600
 gttggaac agattaatgg tatgtatgag cacttggtga aggttattta tgagttggaa 660
 agtcgtaatg agcaaattgt aaaattgcaa aatcaaaagg tttcctttgt ccgcggagca 720
 tcacatgagt tgaaaacccc tttagccagt cttagaatta tcctagagaa tatgcagcat 780
 aatattggag attacaaaga tcatccaaaa tatattgcaa agagtataaa taagattgac 840
 cagatgagcc acttattaga agaagtactg gagtcttcta aattccaaga gtggacagag 900
 tgtcgtgaga ccttgactgt taagccagtt ttagtagata ttttatcacg ttatcaagaa 960
 ttagctcatt caataggtgt tacaattgaa aatcaattga cagatgctac cagggtcgtc 1020
 atgagtctta gggcattgga taaggttttg acaaacctga ttagtaatgc aattaaatat 1080
 tcagataaaa atgggcgtgt aatcatatcc gagcaagatg gctatctctc tatcaaaaat 1140
 acatgtgctc ctctaagtga ccaagaacta gaacatttat ttgatataatt ctatcattct 1200
 caaatcgtga cagataagga tgaaagttcc ggtttgggtc tttacattgt gaataatatt 1260
 ttagaaagct atcaaatgga ttatagtttt ctcccttatg aacacggtat ggaatttaag 1320
 attagcttgt ag 1332

<210> 169

<211> 873

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 169

atggataaaa ttattaaaac tatatcagaa agcggagcct ttcgtgcttt tgccttgat 60
 agcactgaaa ccgtccgcac tgctcaagaa aaacatcaaa cccaagctag ctcaactgta 120
 gcgcttggtc gaactcttat cgctagccag attctcgag ccaatgaaaa aggaaatacc 180
 aaacttacag ttaaggtggt gggatctagc tctctaggtg ctattatcac cgtcgtgat 240
 accaagggga acgtcaaagg ctatgttcaa aatcctgggtg ttgacatcaa aaagactgcg 300
 actggtgaag tcctagtcgg accttttggt ggaaatgggtc aattcctcgt tatcacagac 360
 tacggtactg gaaatcctta caactotata actccctca tctctggaga aatcggtgaa 420
 gaccttgctt tttaccttac tgaaagccaa caaacgcctt cagcggtcgg cctcaatgtc 480
 cttttggacg aggaagacaa ggtcaagggt gcaggtggtt tcctagttca agtcttgcca 540
 ggagccaaga aagaagagat tgctcgcttt gaaaaacgca tccaagaaat gccagctatc 600
 tctactcttc tcgaaagcga cgaccatata gaagccctcc tcaaggctat ctacggggac 660
 gaagcctaca agcgtctttc tgaagaagaa atccgtttcc aatgtgactg tagccatgaa 720
 cgctttatga acgctcttgc cagccttcca agctcagact tacaggaaat gaaagaggaa 780
 gaccacgggg cagaaatcac ttgtcaattc tgccaaacta cttacaactt tgatgaaaag 840
 gacctggagg aactcattcg tgacaaatct taa 873

<210> 170

<211> 459

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 170

atgaaatcaa taactaaaaa gattaaagca actcttgcag gagtagctgc cttgtttgca 60
gtatttgctc catcatttgt atctgctcaa gaatcatcaa cttacactgt taaagaaggt 120
gatacacttt cagaaatcgc tgaaactcac aacacaacag ttgaaaaatt ggcagaaaaac 180
aaccacattg ataacattca tttgatttat gttgatcaag agttgggtat cgatggccct 240
gtagcgctg ttgcaacacc agcgccagct acttatgcgg caccagccgc tcaagatgaa 300
actgtttcag ctccagtagc agaaactcca gtagtaagt aaacagttgt ttcaactgta 360
agcggatctg aagcagaagc caaagaatgg atcgctcaaa aagaatcagg tggtagtata 420
cagctacaaa tggacgttat atcggacgtt accaattaa 459

<210> 171

<211> 2034

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 171

atgaatttag gagaattttg gtacaataaa ataaataaga acagaggaag aaggttaatg 60
aagaaagtaa gattttatatt tttagctctg ctatttttct tagctagtcc agagggtgca 120
atggctagtg atggtacttg gcaaggaaaa cagtatctga aagaagatgg cagtcaagca 180
gcaaatgagt gggtttttga tactcattat caatcttggg tctatataaa agcagatgct 240
aactatgctg aaaatgaatg gctaaagcaa ggtgacgact atttttacct caaatctggg 300
ggctatatgg ccaaatacaga atgggtagaa gacaaggag ctttttatta tcttgaccaa 360
gatggaaaga tgaaaagaaa tgcttggtgta ggaacttcct atgttggtgc aacagggtgcc 420
aaagtaatag aagactgggt ctatgattct caatacgatg cttggtttta tatcaaagca 480
gatggacagc acgcagagaa agaatggctc caaattaaag ggaaggacta ttatttcaaa 540
tcgggtgggt atctactgac aagtcagtgg attaatacaag cttatgtgaa tgctagtggg 600
gccaaagtac agcaagggtg gctttttgac aaacaatacc aatcttgggt ttacatcaaa 660
gaaaatggaa actatgctga taaagaatgg attttcgaga atggctacta ttattatcta 720
aaatccggtg gctacatggc agccaatgaa tggatttggg ataaggaatc ttgggttttat 780
ctcaaatttg atgggaaaat ggctgaaaaa gaatgggtct acgattctca tagtcaagct 840
tgggtactact tcaaataccg tggttacatg acagccaatg aatggatttg ggataaggaa 900
tcttggtttt atctcaaata tgatgggaaa atagctgaaa aagaatgggt ctacgattct 960

09769787.015504

catagtcaag cttggtacta cttcaaatacc ggtggttaca tgacagccaa tgaatggatt 1020
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gtctacgatt ctcatagtca agcttggtac tacttcaaata ctggtggcta catggcgaaa 1140
aatgagacag tagatgggta tcagcttgga agcgatggta aatggcttgg aggaaaaact 1200
acaaatgaaa atgctgctta ctatcaagta gtgcctgcta cagccaatgt ttatgattca 1260
gatggtgaaa agctttccta tatatogcaa ggtagtgtcg tatggctaga taaggataga 1320
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gaagatttac aagcgctaga tgctagtaag gactttatcc cttattatga gagtgatggc 1440
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cttgaaaca aggcttctgg tatgaatgtg gaatatgctt cagaccctta ttggggcgaa 1980
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<210> 172

<211> 930

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 172

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ccgattgggc aagaccaca cgaatacgaa ccacttctg aagacgttaa gaaaacttct 240
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<211> 1260
<212> DNA
<213> Streptococcus pneumoniae
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<400> 173						
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<210> 174

<211> 1680

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 174

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 gactacaatg cctattatct ggctcagttg aaggaaatct tatcaaacc taactatggg 480
 aatgctggta agttcgctga ggtttgatg gatggtgcc gagagagagg cgcgcaaaag 540
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00969787-01364

<210> 175

<211> 684

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 175

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 ctattttagt tggcatatth ggggtgttta acaactaaga gccagcgctt atcttggtta 180
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 caggatttgc atgatagtct gggacatacc ttgctatgc tgagtgtcaa gacagattta 600
 gccttgagcgt tatttcagat ggaggcttat ccacaggtgg aaaaggaatt aaaagaaatt 660
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<210> 176

<211> 1113

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 176

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<210> 177

<211> 1017

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 177

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<210> 178

<211> 1092

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 178

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<210> 179

<211> 942

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 179

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<210> 180

<211> 1395

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 180

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<210> 181

<211> 801

<212> DNA

<213> Streptococcus pneumoniae

<400> 181

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<210> 182

<211> 780

<212> DNA

<213> Streptococcus pneumoniae

<400> 182

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<210> 183

<211> 792

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 183

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<210> 184

<211> 744

<212> PRT

<213> Streptococcus pneumoniae

<400> 184

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20 25 30

Glu Ser Pro Gln Val Val Glu Lys Ser Ser Leu Glu Lys Lys Tyr Glu

35 40 45

Glu Ala Lys Ala Lys Ala Asp Thr Ala Lys Lys Asp Tyr Glu Thr Ala

50 55 60

Lys Lys Lys Ala Glu Asp Ala Gln Lys Lys Tyr Glu Asp Asp Gln Lys

65 70 75 80

Arg Thr Glu Glu Lys Ala Arg Lys Glu Ala Glu Ala Ser Gln Lys Leu

85 90 95

Asn Asp Val Ala Leu Val Val Gln Asn Ala Tyr Lys Glu Tyr Arg Glu

100 105 110

Val Gln Asn Gln Arg Ser Lys Tyr Lys Ser Asp Ala Glu Tyr Gln Lys

115 120 125

Lys Leu Thr Glu Val Asp Ser Lys Ile Glu Lys Ala Arg Lys Glu Gln

130 135 140

Gln Asp Leu Gln Asn Lys Phe Asn Glu Val Arg Ala Val Val Val Pro

145 150 155 160

Glu Pro Asn Ala Leu Ala Glu Thr Lys Lys Lys Ala Glu Glu Ala Lys

165 170 175

00359797-043604

363

Ala Glu Glu Lys Val Ala Lys Arg Lys Tyr Asp Tyr Ala Thr Leu Lys
180 185 190

Val Ala Leu Ala Lys Lys Glu Val Glu Ala Lys Glu Leu Glu Ile Glu
195 200 205

Lys Leu Gln Tyr Glu Ile Ser Thr Leu Glu Gln Glu Val Ala Thr Ala
210 215 220

Gln His Gln Val Asp Asn Leu Lys Lys Leu Leu Ala Gly Ala Asp Pro
225 230 235 240

Asp Asp Gly Thr Glu Val Ile Glu Ala Lys Leu Lys Lys Gly Glu Ala
245 250 255

Glu Leu Asn Ala Lys Gln Ala Glu Leu Ala Lys Lys Gln Thr Glu Leu
260 265 270

Glu Lys Leu Leu Asp Ser Leu Asp Pro Glu Gly Lys Thr Gln Asp Glu
275 280 285

Leu Asp Lys Glu Ala Glu Glu Ala Glu Leu Asp Lys Lys Ala Asp Glu
290 295 300

Leu Gln Asn Lys Val Ala Asp Leu Glu Lys Glu Ile Ser Asn Leu Glu
305 310 315 320

Ile Leu Leu Gly Gly Ala Asp Pro Glu Asp Asp Thr Ala Ala Leu Gln
325 330 335

Asn Lys Leu Ala Ala Lys Lys Ala Glu Leu Ala Lys Lys Gln Thr Glu
340 345 350

Leu Glu Lys Leu Leu Asp Ser Leu Asp Pro Glu Gly Lys Thr Gln Asp
355 360 365

Glu Leu Asp Lys Glu Ala Glu Glu Ala Glu Leu Asp Lys Lys Ala Asp
370 375 380

007607.013604

365

Ser Asp Lys Trp Tyr Tyr Val Asn Ser Asn Gly Ala Met Ala Thr Gly
595 600 605

Trp Leu Gln Tyr Asn Gly Ser Trp Tyr Tyr Leu Asn Ala Asn Gly Asp
610 615 620

Met Ala Thr Gly Trp Leu Gln Tyr Asn Gly Ser Trp Tyr Tyr Leu Asn
625 630 635 640

Ala Asn Gly Asp Met Ala Thr Gly Trp Ala Lys Val Asn Gly Ser Trp
645 650 655

Tyr Tyr Leu Asn Ala Asn Gly Ala Met Ala Thr Gly Trp Ala Lys Val
660 665 670

Asn Gly Ser Trp Tyr Tyr Leu Asn Ala Asn Gly Ser Met Ala Thr Gly
675 680 685

Trp Val Lys Asp Gly Asp Thr Trp Tyr Tyr Leu Glu Ala Ser Gly Ala
690 695 700

Met Lys Ala Ser Gln Trp Phe Lys Val Ser Asp Lys Trp Tyr Tyr Val
705 710 715 720

Asn Gly Leu Gly Ala Leu Ala Val Asn Thr Thr Val Asp Gly Tyr Lys
725 730 735

Val Asn Ala Asn Gly Glu Trp Val
740

<210> 185

<211> 693

<212> PRT

<213> Streptococcus pneumoniae

<400> 185

Met Phe Ala Ser Lys Ser Glu Arg Lys Val His Tyr Ser Ile Arg Lys

1

5

10

15

00769757-013504

366

Phe Ser Val Gly Val Ala Ser Val Val Val Ala Ser Leu Val Met Gly
20 25 30

Ser Val Val His Ala Thr Glu Asn Glu Gly Ala Thr Gln Val Pro Thr
35 40 45

Ser Ser Asn Arg Ala Asn Glu Ser Gln Ala Glu Gln Gly Glu Gln Pro
50 55 60

Lys Lys Leu Asp Ser Glu Arg Asp Lys Ala Arg Lys Glu Val Glu Glu
65 70 75 80

Tyr Val Lys Lys Ile Val Gly Glu Ser Tyr Ala Lys Ser Thr Lys Lys
85 90 95

Arg His Thr Ile Thr Val Ala Leu Val Asn Glu Leu Asn Asn Ile Lys
100 105 110

Asn Glu Tyr Leu Asn Lys Ile Val Glu Ser Thr Ser Glu Ser Gln Leu
115 120 125

Gln Ile Leu Met Met Glu Ser Arg Ser Lys Val Asp Glu Ala Val Ser
130 135 140

Lys Phe Glu Lys Asp Ser Ser Ser Ser Ser Ser Ser Asp Ser Ser Thr
145 150 155 160

Lys Pro Glu Ala Ser Asp Thr Ala Lys Pro Asn Lys Pro Thr Glu Pro
165 170 175

Gly Glu Lys Val Ala Glu Ala Lys Lys Lys Val Glu Glu Ala Glu Lys
180 185 190

Lys Ala Lys Asp Gln Lys Glu Glu Asp Arg Arg Asn Tyr Pro Thr Ile
195 200 205

Thr Tyr Lys Thr Leu Glu Leu Glu Ile Ala Glu Ser Asp Val Glu Val
210 215 220

00759707 042504

367

Lys Lys Ala Glu Leu Glu Leu Val Lys Val Lys Ala Asn Glu Pro Arg
225 230 235 240

Asp Glu Gln Lys Ile Lys Gln Ala Glu Ala Glu Val Glu Ser Lys Gln
245 250 255

Ala Glu Ala Thr Arg Leu Lys Lys Ile Lys Thr Asp Arg Glu Glu Ala
260 265 270

Glu Glu Glu Ala Lys Arg Arg Ala Asp Ala Lys Glu Gln Gly Lys Pro
275 280 285

Lys Gly Arg Ala Lys Arg Gly Val Pro Gly Glu Leu Ala Thr Pro Asp
290 295 300

Lys Lys Glu Asn Asp Ala Lys Ser Ser Asp Ser Ser Val Gly Glu Glu
305 310 315 320

Thr Leu Pro Ser Pro Ser Leu Lys Pro Glu Lys Lys Val Ala Glu Ala
325 330 335

Glu Lys Lys Val Glu Glu Ala Lys Lys Lys Ala Glu Asp Gln Lys Glu
340 345 350

Glu Asp Arg Arg Asn Tyr Pro Thr Asn Thr Tyr Lys Thr Leu Glu Leu
355 360 365

Glu Ile Ala Glu Ser Asp Val Glu Val Lys Lys Ala Glu Leu Glu Leu
370 375 380

Val Lys Glu Glu Ala Lys Glu Pro Arg Asn Glu Glu Lys Val Lys Gln
385 390 395 400

Ala Lys Ala Glu Val Glu Ser Lys Lys Ala Glu Ala Thr Arg Leu Glu
405 410 415

Lys Ile Lys Thr Asp Arg Lys Lys Ala Glu Glu Glu Ala Lys Arg Lys
420 425 430

00769787 042504

Ala Ala Glu Glu Asp Lys Val Lys Glu Lys Pro Ala Glu Gln Pro Gln
 435 440 445

Pro Ala Pro Ala Pro Lys Ala Glu Lys Pro Ala Pro Ala Pro Lys Pro
 450 455 460

Glu Asn Pro Ala Glu Gln Pro Lys Ala Glu Lys Pro Ala Asp Gln Gln
 465 470 475 480

Ala Glu Glu Asp Tyr Ala Arg Arg Ser Glu Glu Glu Tyr Asn Arg Leu
 485 490 495

Thr Gln Gln Gln Pro Pro Lys Thr Glu Lys Pro Ala Gln Pro Ser Thr
 500 505 510

Pro Lys Thr Gly Trp Lys Gln Glu Asn Gly Met Trp Tyr Phe Tyr Asn
 515 520 525

Thr Asp Gly Ser Met Ala Thr Gly Trp Leu Gln Asn Asn Gly Ser Trp
 530 535 540

Tyr Tyr Leu Asn Ser Asn Gly Ala Met Ala Thr Gly Trp Leu Gln Asn
 545 550 555 560

Asn Gly Ser Trp Tyr Tyr Leu Asn Ala Asn Gly Ser Met Ala Thr Gly
 565 570 575

Trp Leu Gln Asn Asn Gly Ser Trp Tyr Tyr Leu Asn Ala Asn Gly Ser
 580 585 590

Met Ala Thr Gly Trp Leu Gln Tyr Asn Gly Ser Trp Tyr Tyr Leu Asn
 595 600 605

Ala Asn Gly Ser Met Ala Thr Gly Trp Leu Gln Tyr Asn Gly Ser Trp
 610 615 620

Tyr Tyr Leu Asn Ala Asn Gly Asp Met Ala Thr Gly Trp Val Lys Asp
 625 630 635 640

00769797 013601

369

Gly Asp Thr Trp Tyr Tyr Leu Glu Ala Ser Gly Ala Met Lys Ala Ser
645 650 655

Gln Trp Phe Lys Val Ser Asp Lys Trp Tyr Tyr Val Asn Gly Ser Gly
660 665 670

Ala Leu Ala Val Asn Thr Thr Val Asp Gly Tyr Gly Val Asn Ala Asn
675 680 685

Gly Glu Trp Val Asn
690

<210> 186

<211> 129

<212> PRT

<213> Streptococcus pneumoniae

<400> 186

Met Val Lys Arg Arg Ile Arg Arg Gly Thr Arg Glu Pro Glu Lys Val
1 5 10 15

Val Val Pro Glu Gln Ser Ser Ile Pro Ser Tyr Pro Val Ser Val Thr
20 25 30

Ser Asn Gln Gly Thr Asp Val Ala Val Glu Pro Ala Lys Ala Val Ala
35 40 45

Pro Thr Thr Asp Trp Lys Gln Glu Asn Gly Met Trp Tyr Phe Tyr Asn
50 55 60

Thr Asp Gly Ser Met Ala Thr Gly Trp Val Gln Val Asn Ser Ser Trp
65 70 75 80

Tyr Tyr Leu Asn Ser Asn Gly Ser Met Lys Val Asn Gln Trp Phe Gln
85 90 95

00260397-013604

370

Val Gly Gly Lys Trp Tyr Tyr Val Asn Thr Ser Gly Glu Leu Ala Val
100 105 110

Asn Thr Ser Ile Asp Gly Tyr Arg Val Asn Asp Asn Gly Glu Trp Val
115 120 125

Arg

<210> 187

<211> 230

<212> PRT

<213> Streptococcus pneumoniae

<400> 187

Leu Asn Thr Ser Phe Val His Ala Ala Asp Gly Ile Gln Tyr Val Arg
1 5 10 15

Asp Asp Thr Arg Asp Lys Glu Glu Gly Ile Glu Tyr Asp Asp Ala Asp
20 25 30

Asn Gly Asp Ile Ile Val Lys Val Ala Thr Lys Pro Lys Val Val Thr
35 40 45

Lys Lys Ile Ser Ser Thr Arg Ile Arg Tyr Glu Lys Asp Glu Thr Lys
50 55 60

Asp Arg Ser Glu Asn Pro Val Thr Ile Asp Gly Glu Asp Gly Tyr Val
65 70 75 80

Thr Thr Thr Arg Thr Tyr Asp Val Asn Pro Glu Thr Gly Tyr Val Thr
85 90 95

Glu Gln Val Thr Val Asp Arg Lys Glu Ala Thr Asp Thr Val Ile Lys
100 105 110

09369797 043504

371

Val Pro Ala Lys Ser Lys Val Glu Glu Val Leu Val Pro Phe Ala Thr
115 120 125

Lys Tyr Glu Ala Asp Asn Asp Leu Ser Ala Gly Gln Glu Gln Glu Ile
130 135 140

Thr Leu Gly Lys Asn Gly Lys Thr Val Thr Thr Ile Thr Tyr Asn Val
145 150 155 160

Asp Gly Lys Ser Gly Gln Val Thr Glu Ser Thr Leu Ser Gln Lys Lys
165 170 175

Asp Ser Gln Thr Arg Val Val Lys Lys Arg Thr Lys Pro Gln Val Leu
180 185 190

Val Gln Glu Ile Pro Ile Glu Thr Glu Tyr Leu Asp Gly Pro Thr Leu
195 200 205

Asp Lys Ser Gln Glu Val Glu Glu Val Gly Glu Ile Gly Lys Leu Leu
210 215 220

Leu Leu Gln Ser Ile Leu
225 230

<210> 188

<211> 340

<212> PRT

<213> Streptococcus pneumoniae

<400> 188

Met Lys Leu Leu Lys Lys Met Met Gln Ile Ala Leu Ala Thr Phe Phe
1 5 10 15

Phe Gly Leu Leu Ala Thr Asn Thr Val Phe Ala Asp Asp Ser Glu Gly
20 25 30

Trp Gln Phe Val Gln Glu Asn Gly Arg Thr Tyr Tyr Lys Lys Gly Asp
 35 40 45

Leu Lys Glu Thr Tyr Trp Arg Val Ile Asp Gly Lys Tyr Tyr Tyr Phe
 50 55 60

Asp Pro Leu Ser Gly Glu Met Val Val Gly Trp Gln Tyr Ile Pro Ala
 65 70 75 80

Pro His Lys Gly Val Thr Ile Gly Pro Ser Pro Arg Ile Glu Ile Ala
 85 90 95

Leu Arg Pro Asp Trp Phe Tyr Phe Gly Gln Asp Gly Val Leu Gln Glu
 100 105 110

Phe Val Gly Lys Gln Val Leu Glu Ala Lys Thr Ala Thr Asn Thr Asn
 115 120 125

Lys His His Gly Glu Glu Tyr Asp Ser Gln Ala Glu Lys Arg Val Tyr
 130 135 140

Tyr Phe Glu Asp Gln Arg Ser Tyr His Thr Leu Lys Thr Gly Trp Ile
 145 150 155 160

Tyr Glu Glu Gly His Trp Tyr Tyr Leu Gln Lys Asp Gly Gly Phe Asp
 165 170 175

Ser Arg Ile Asn Arg Leu Thr Val Gly Glu Leu Ala Arg Gly Trp Val
 180 185 190

Lys Asp Tyr Pro Leu Thr Tyr Asp Glu Glu Lys Leu Lys Ala Ala Pro
 195 200 205

Trp Tyr Tyr Leu Asn Pro Ala Thr Gly Ile Met Gln Thr Gly Trp Gln
 210 215 220

Tyr Leu Gly Asn Arg Trp Tyr Tyr Leu His Ser Ser Gly Ala Met Ala
 225 230 235 240

09769797 045604

373

Thr Gly Trp Tyr Lys Glu Gly Ser Thr Trp Tyr Tyr Leu Asp Ala Glu
245 250 255

Asn Gly Asp Met Arg Thr Gly Trp Gln Asn Leu Gly Asn Lys Trp Tyr
260 265 270

Tyr Leu Arg Ser Ser Gly Ala Met Ala Thr Gly Trp Tyr Gln Glu Ser
275 280 285

Ser Thr Trp Tyr Tyr Leu Asn Ala Ser Asn Gly Asp Met Lys Thr Gly
290 295 300

Trp Phe Gln Val Asn Gly Asn Trp Tyr Tyr Ala Tyr Asp Ser Gly Ala
305 310 315 320

Leu Ala Val Asn Thr Thr Val Gly Gly Tyr Tyr Leu Asn Tyr Asn Gly
325 330 335

Glu Trp Val Lys
340

<210> 189

<211> 181

<212> PRT

<213> Streptococcus pneumoniae

<400> 189

Leu Ala Gly Arg Tyr Gly Ser Ala Val Gln Cys Thr Glu Val Thr Ala
1 5 10 15

Ser Asn Leu Ser Thr Val Lys Thr Lys Ala Thr Val Val Glu Lys Pro
20 25 30

Leu Lys Asp Phe Arg Ala Ser Thr Ser Asp Gln Ser Gly Trp Val Glu
35 40 45

009269797 043604

374

Ser Asn Gly Lys Trp Tyr Phe Tyr Glu Ser Gly Asp Val Lys Thr Gly
50 55 60

Trp Val Lys Thr Asp Gly Lys Trp Tyr Tyr Leu Asn Asp Leu Gly Val
65 70 75 80

Met Gln Thr Gly Phe Val Lys Phe Ser Gly Ser Trp Tyr Tyr Leu Ser
85 90 95

Asn Ser Gly Ala Met Phe Thr Gly Trp Gly Thr Asp Gly Ser Arg Trp
100 105 110

Phe Tyr Phe Asp Gly Ser Gly Ala Met Lys Thr Gly Trp Tyr Lys Glu
115 120 125

Asn Gly Thr Trp Tyr Tyr Leu Asp Glu Ala Gly Ile Met Lys Thr Gly
130 135 140

Trp Phe Lys Val Gly Pro His Trp Tyr Tyr Ala Tyr Gly Ser Gly Ala
145 150 155 160

Leu Ala Val Ser Thr Thr Thr Pro Asp Gly Tyr Arg Val Asn Gly Asn
165 170 175

Gly Glu Trp Val Asn
180

<210> 190

<211> 332

<212> PRT

<213> Streptococcus pneumoniae

<400> 190

Met Lys Ile Leu Lys Lys Thr Met Gln Val Gly Leu Thr Val Phe Phe
1 5 10 15

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[illegible]

Gly Ile Met Gln Thr Gly Trp Gln Tyr Leu Gly Asn Lys Trp Tyr Tyr
210 215 220

376

Leu Arg Ser Ser Gly Ala Met Ala Thr Gly Trp Tyr Gln Glu Gly Thr
225 230 235 240

Thr Trp Tyr Tyr Leu Asp His Pro Asn Gly Asp Met Lys Thr Gly Trp
245 250 255

Gln Asn Leu Gly Asn Lys Trp Tyr Tyr Leu Arg Ser Ser Gly Ala Met
260 265 270

Ala Thr Gly Trp Tyr Gln Asp Gly Ser Thr Trp Tyr Tyr Leu Asn Ala
275 280 285

Gly Asn Gly Asp Met Lys Thr Gly Trp Phe Gln Val Asn Gly Asn Trp
290 295 300

Tyr Tyr Ala Tyr Ser Ser Gly Ala Leu Ala Val Asn Thr Thr Val Asp
305 310 315 320

Gly Tyr Ser Val Asn Tyr Asn Gly Glu Trp Val Arg
325 330

<210> 191

<211> 627

<212> PRT

<213> Streptococcus pneumoniae

<400> 191

Met Lys Lys Lys Leu Thr Ser Leu Ala Leu Val Gly Ala Phe Leu Gly
1 5 10 15

Leu Ser Trp Tyr Gly Asn Val Gln Ala Gln Glu Ser Ser Gly Asn Lys
20 25 30

Ile His Phe Ile Asn Val Gln Glu Gly Gly Ser Asp Ala Ile Ile Leu
35 40 45

009697-01360

377

Glu Ser Asn Gly His Phe Ala Met Val Asp Thr Gly Glu Asp Tyr Asp
50 55 60

Phe Pro Asp Gly Ser Asp Ser Arg Tyr Pro Trp Arg Glu Gly Ile Glu
65 70 75 80

Thr Ser Tyr Lys His Val Leu Thr Asp Arg Val Phe Arg Arg Leu Lys
85 90 95

Glu Leu Gly Val Gln Lys Leu Asp Phe Ile Leu Val Thr His Thr His
100 105 110

Ser Asp His Ile Gly Asn Val Asp Glu Leu Leu Ser Thr Tyr Pro Val
115 120 125

Asp Arg Val Tyr Leu Lys Lys Tyr Ser Asp Ser Arg Ile Thr Asn Ser
130 135 140

Glu Arg Leu Trp Asp Asn Leu Tyr Gly Tyr Asp Lys Val Leu Gln Thr
145 150 155 160

Ala Ala Glu Lys Gly Val Ser Val Ile Gln Asn Ile Thr Gln Gly Asp
165 170 175

Ala His Phe Gln Phe Gly Asp Met Asp Ile Gln Leu Tyr Asn Tyr Glu
180 185 190

Asn Glu Thr Asp Ser Ser Gly Glu Leu Lys Lys Ile Trp Asp Asp Asn
195 200 205

Ser Asn Ser Leu Ile Ser Val Val Lys Val Asn Gly Lys Lys Ile Tyr
210 215 220

Leu Gly Gly Asp Leu Asp Asn Val His Gly Ala Glu Asp Lys Tyr Gly
225 230 235 240

Pro Leu Ile Gly Lys Val Asp Leu Met Lys Phe Asn His His His Asp
245 250 255

109270 1546260

378

Thr Asn Lys Ser Asn Thr Lys Asp Phe Ile Lys Asn Leu Ser Pro Ser
260 265 270

Leu Ile Val Gln Thr Ser Asp Ser Leu Pro Trp Lys Asn Gly Val Asp
275 280 285

Ser Glu Tyr Val Asn Trp Leu Lys Glu Arg Gly Ile Glu Arg Ile Asn
290 295 300

Ala Ala Ser Lys Asp Tyr Asp Ala Thr Val Phe Asp Ile Arg Lys Asp
305 310 315 320

Gly Phe Val Asn Ile Ser Thr Ser Tyr Lys Pro Ile Pro Ser Phe Gln
325 330 335

Ala Gly Trp His Lys Ser Ala Tyr Gly Asn Trp Trp Tyr Gln Ala Pro
340 345 350

Asp Ser Thr Gly Glu Tyr Ala Val Gly Trp Asn Glu Ile Glu Gly Glu
355 360 365

Trp Tyr Tyr Phe Asn Gln Thr Gly Ile Leu Leu Gln Asn Gln Trp Lys
370 375 380

Lys Trp Asn Asn His Trp Phe Tyr Leu Thr Asp Ser Gly Ala Ser Ala
385 390 395 400

Lys Asn Trp Lys Lys Ile Ala Gly Ile Trp Tyr Tyr Phe Asn Lys Glu
405 410 415

Asn Gln Met Glu Ile Gly Trp Ile Gln Asp Lys Glu Gln Trp Tyr Tyr
420 425 430

Leu Asp Val Asp Gly Ser Met Lys Thr Gly Trp Leu Gln Tyr Met Gly
435 440 445

Gln Trp Tyr Tyr Phe Ala Pro Ser Gly Glu Met Lys Met Gly Trp Val
450 455 460

00760787 013501

Figure 1 consists of 11 scatter plots, labeled (a) through (k), each showing the relationship between a specific variable and the 'Number of children' (ranging from 0 to 10 on the x-axis). The variables are: (a) Age, (b) Sex, (c) Education, (d) Income, (e) Religion, (f) Ethnicity, (g) Marital status, (h) Health status, (i) Employment status, (j) Social capital, and (k) Life satisfaction. The plots show various trends: (a) Age increases with the number of children; (b) Sex is mostly female; (c) Education levels vary; (d) Income generally decreases; (e) Religion is mostly Christian; (f) Ethnicity is mostly White; (g) Marital status is mostly married; (h) Health status is mostly good; (i) Employment status is mostly employed; (j) Social capital is mostly high; and (k) Life satisfaction is mostly high.

Ser Glu Gln
625

<210> 192

<211> 318

<212> PRT

<213> Streptococcus pneumoniae

<400> 192

Met Glu Ile Asn Val Ser Lys Leu Arg Thr Asp Leu Pro Gln Val Gly

1

5

10

15

Val Gln Pro Tyr Arg Gln Val His Ala His Ser Thr Gly Asn Pro His

20

25

30

Ser Thr Val Gln Asn Glu Ala Asp Tyr His Trp Arg Lys Asp Pro Glu

35

40

45

Leu Gly Phe Phe Ser His Ile Val Gly Asn Gly Cys Ile Met Gln Val

50

55

60

Gly Pro Val Asp Asn Gly Ala Trp Asp Val Gly Gly Gly Trp Asn Ala

65

70

75

80

Glu Thr Tyr Ala Ala Val Glu Leu Ile Glu Ser His Ser Thr Lys Glu

85

90

95

Glu Phe Met Thr Asp Tyr Arg Leu Tyr Ile Glu Leu Leu Arg Asn Leu

100

105

110

Ala Asp Glu Ala Gly Leu Pro Lys Thr Leu Asp Thr Gly Ser Leu Ala

115

120

125

Gly Ile Lys Thr His Glu Tyr Cys Thr Asn Asn Gln Pro Asn Asn His

130

135

140

Ser Asp His Val Asp Pro Tyr Pro Tyr Leu Ala Lys Trp Gly Ile Ser

145

150

155

160

Arg Glu Gln Phe Lys His Asp Ile Glu Asn Gly Leu Thr Ile Glu Thr

165

170

175

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381

Gly Trp Gln Lys Asn Asp Thr Gly Tyr Trp Tyr Val His Ser Asp Gly
180 185 190

Ser Tyr Pro Lys Asp Lys Phe Glu Lys Ile Asn Gly Thr Trp Tyr Tyr
195 200 205

Phe Asp Ser Ser Gly Tyr Met Leu Ala Asp Arg Trp Arg Lys His Thr
210 215 220

Asp Gly Asn Trp Tyr Trp Phe Asp Asn Ser Gly Glu Met Ala Thr Gly
225 230 235 240

Trp Lys Lys Ile Ala Asp Lys Trp Tyr Tyr Phe Asn Glu Glu Gly Ala
245 250 255

Met Lys Thr Gly Trp Val Lys Tyr Lys Asp Thr Trp Tyr Tyr Leu Asp
260 265 270

Ala Lys Glu Gly Ala Met Val Ser Asn Ala Phe Ile Gln Ser Ala Asp
275 280 285

Gly Thr Gly Trp Tyr Tyr Leu Lys Pro Asp Gly Thr Leu Ala Asp Lys
290 295 300

Pro Glu Phe Thr Val Glu Pro Asp Gly Leu Ile Thr Val Lys
305 310 315

<210> 193

<211> 513

<212> PRT

<213> Streptococcus pneumoniae

<400> 193

Met Gly Thr Thr Gly Phe Thr Ile Ile Asp Leu Ile Ile Leu Ile Val
1 5 10 15

Phe Gly Ala Val Ala Glu Thr Leu Ala Asn Gly Lys Phe Leu Ala Ala
210 215 220

[illegible]

Leu Gly Leu Leu Gly Gly Val Phe Ile Leu Gly Phe Val Ser Lys Lys
420 425 430

384

Ala Asn Lys Gln Gly Ala Tyr Ala Ala Leu Ile Val Ser Thr Ile Val
435 440 445

Met Val Phe Ile Lys Tyr Phe Leu Pro Pro Thr Ala Val Ser Tyr Trp
450 455 460

Ala Tyr Ser Leu Ile Ser Ile Ser Val Ser Val Val Ser Gly Tyr Ile
465 470 475 480

Val Ser Val Leu Thr Gly Asn Lys Val Ser Ala Pro Lys Tyr Thr Thr
485 490 495

Ile His Asp Ile Thr Glu Ile Lys Ala Asp Ser Ser Trp Glu Val Arg
500 505 510

His

<210> 194

<211> 826

<212> PRT

<213> Streptococcus pneumoniae

<400> 194

Met Lys Ile Asn Lys Lys Tyr Leu Ala Gly Ser Val Ala Val Leu Ala
1 5 10 15

Leu Ser Val Cys Ser Tyr Glu Leu Gly Arg His Gln Ala Gly Gln Asp
20 25 30

Lys Lys Glu Ser Asn Arg Val Ala Tyr Ile Asp Gly Asp Gln Ala Gly
35 40 45

Gln Lys Ala Glu Asn Leu Thr Pro Asp Glu Val Ser Lys Arg Glu Gly
50 55 60

385

Ile Asn Ala Glu Gln Ile Val Ile Lys Ile Thr Asp Gln Gly Tyr Val
65 70 75 80

Thr Ser His Gly Asp His Tyr His Tyr Tyr Asn Gly Lys Val Pro Tyr
85 90 95

Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Lys Asp Pro Asn Tyr Gln
100 105 110

Leu Lys Asp Ser Asp Ile Val Asn Glu Ile Lys Gly Gly Tyr Val Ile
115 120 125

Lys Val Asp Gly Lys Tyr Tyr Val Tyr Leu Lys Asp Ala Ala His Ala
130 135 140

Asp Asn Ile Arg Thr Lys Glu Glu Ile Lys Arg Gln Lys Gln Glu Arg
145 150 155 160

Ser His Asn His Gly Ser Gly Ala Asn Asp His Ala Val Ala Ala Ala
165 170 175

Arg Ala Gln Gly Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Asn Ala
180 185 190

Ser Asp Ile Ile Glu Asp Thr Gly Asp Ala Tyr Ile Val Pro His Gly
195 200 205

Asp His Tyr His Tyr Ile Pro Lys Asn Glu Leu Ser Ala Ser Glu Leu
210 215 220

Ala Ala Ala Glu Ala Tyr Trp Asn Gly Lys Gln Gly Ser Arg Pro Ser
225 230 235 240

Ser Ser Ser Ser Tyr Asn Ala Asn Pro Ala Gln Pro Arg Leu Ser Glu
245 250 255

Asn His Asn Leu Thr Val Thr Pro Thr Tyr His Gln Asn Gln Gly Glu
260 265 270

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[illegible]

Leu Leu Asp Asn Lys Gly Arg Gln Val Asp Phe Glu Ala Leu Asp Asn
465 470 475 480

387

Leu Leu Glu Arg Leu Lys Asp Val Pro Ser Asp Lys Val Lys Leu Val
485 490 495

Asp Asp Ile Leu Ala Phe Leu Ala Pro Ile Arg His Pro Glu Arg Leu
500 505 510

Gly Lys Pro Asn Ala Gln Ile Thr Tyr Thr Asp Asp Glu Ile Gln Val
515 520 525

Ala Lys Leu Ala Gly Lys Tyr Thr Thr Glu Asp Gly Tyr Ile Phe Asp
530 535 540

Pro Arg Asp Ile Thr Ser Asp Glu Gly Asp Ala Tyr Val Thr Pro His
545 550 555 560

Met Thr His Ser His Trp Ile Lys Lys Asp Ser Leu Ser Glu Ala Glu
565 570 575

Arg Ala Ala Ala Gln Ala Tyr Ala Lys Glu Lys Gly Leu Thr Pro Pro
580 585 590

Ser Thr Asp His Gln Asp Ser Gly Asn Thr Glu Ala Lys Gly Ala Glu
595 600 605

Ala Ile Tyr Asn Arg Val Lys Ala Ala Lys Lys Val Pro Leu Asp Arg
610 615 620

Met Pro Tyr Asn Leu Gln Tyr Thr Val Glu Val Lys Asn Gly Ser Leu
625 630 635 640

Ile Ile Pro His Tyr Asp His Tyr His Asn Ile Lys Phe Glu Trp Phe
645 650 655

Asp Glu Gly Leu Tyr Glu Ala Pro Lys Gly Tyr Thr Leu Glu Asp Leu
660 665 670

Leu Ala Thr Val Lys Tyr Tyr Val Glu His Pro Asn Glu Arg Pro His
675 680 685

0096970 013604

388

Ser Asp Asn Gly Phe Gly Asn Ala Ser Asp His Val Gln Arg Asn Lys
690 695 700

Asn Gly Gln Ala Asp Thr Asn Gln Thr Glu Lys Pro Ser Glu Glu Lys
705 710 715 720

Pro Gln Thr Glu Lys Pro Glu Glu Glu Thr Pro Arg Glu Glu Lys Pro
725 730 735

Gln Ser Glu Lys Pro Glu Ser Pro Lys Pro Thr Glu Glu Pro Glu Glu
740 745 750

Ser Pro Glu Glu Ser Glu Glu Pro Gln Val Glu Thr Glu Lys Val Glu
755 760 765

Glu Lys Leu Arg Glu Ala Glu Asp Leu Leu Gly Lys Ile Gln Asp Pro
770 775 780

Ile Ile Lys Ser Asn Ala Lys Glu Thr Leu Thr Gly Leu Lys Asn Asn
785 790 795 800

Leu Leu Phe Gly Thr Gln Asp Asn Asn Thr Ile Met Ala Glu Ala Glu
805 810 815

Lys Leu Leu Ala Leu Leu Lys Glu Ser Lys
820 825

<210> 195

<211> 295

<212> PRT

<213> Streptococcus pneumoniae

<400> 195

Met Glu Gly Leu Val Arg Val His Leu Leu Pro Val Phe Gly Asp Tyr
1 5 10 15

Thr Glu Lys Tyr Ala Tyr Ala Cys Asn Leu Arg Lys Arg Leu Asn Lys
210 215 220

390

His Phe Asp Ala Ala Gly Val Thr Asn Val Ser Phe His Gly Phe Arg
225 230 235 240

His Thr His Thr Thr Met Met Leu Tyr Ala Gln Val Ser Pro Lys Asp
245 250 255

Val Gln Tyr Arg Leu Gly His Ser Asn Leu Met Ile Thr Glu Asn Thr
260 265 270

Tyr Trp His Thr Asn Gln Glu Asn Ala Lys Lys Ala Val Ser Asn Tyr
275 280 285

Glu Thr Ala Ile Asn Asn Leu
290 295

<210> 196

<211> 2235

<212> DNA

<213> Streptococcus pneumoniae

<400> 196

atgaataaga aaaaaatgat tttaacaagt ctagccagcg tcgctatctt aggggctggt 60
tttgttacgt ctcagcctac ttttgtaaga gcagaagaat ctccacaagt tgtcgaaaaa 120
tcttcattag agaagaaata tgaggaagca aaagcaaaag ctgatactgc caagaaagat 180
tacgaaacgg ctaaaaagaa agcagaagac gctcagaaaa agtatgaaga tgatcagaag 240
agaactgagg agaaagctcg aaaagaagca gaagcatctc aaaaattgaa tgatgtggcg 300
cttggtgttc aaaatgcata taaagagtac cgagaagttc aaaatcaacg tagtaaatat 360
aaatctgacg ctgaatatca gaaaaaatta acagaggtcg actctaaaat agagaaggct 420
aggaaagagc aacaggactt gcaaaataaa tttaatgaag taagagcagt ttagtttcct 480
gaaccaaagc cggttggtga gactaagaaa aaagcagaag aagctaaagc agaagaaaaa 540
gtagctaaga gaaaatatga ttatgcaact ctaaaggtag cactagcgaa gaaagaagta 600
gaggctaagg aacttgaaat tgaaaaactt caatatgaaa tttctacttt ggaacaagaa 660
gttgctactg ctcaacatca agtagataat ttgaaaaaac ttcttgctgg tgcggatcct 720
gatgatggca cagaagttat agaagctaaa ttaaaaaaag gagaagctga gctaaacgct 780
aaacaagctg agttagcaaa aaaacaaaca gaacttgaaa aacttcttga cagccttgat 840
cctgaaggta agactcagga tgaattagat aaagaagcag aagaagctga gttggataaa 900

aaagctgatg aacttcaaaa taaagttgct gatttagaaa aagaaattag taaccttgaa 960
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<210> 197

<211> 2082

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 197

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<210> 198

<211> 390

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 198

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<210> 199

<211> 693

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 199

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 gaatatctcg atggcccaac tcttgataaa agtcaagaag tagaagaagt aggagaaatt 660
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<210> 200

<211> 1023

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 200

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<210> 201

<211> 546

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 201

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 tctgatcagt ctggttgggt ggaatctaata ggtaaatggt atttctatga gtctgggtgat 180
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 atgaagacag gttgggtttaa agtcggacca cactgggtact atgcctacgg ttcaggagct 480
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<210> 202

<211> 999

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 202

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<210> 203

<211> 1884

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 203

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<210> 204

<211> 957

<212> DNA

<213> Streptococcus pneumoniae

<400> 204

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 aatgccttta tccagtcagc ggacggaaca ggctggtact acctcaaacc agacggaaca 900
 ctggcagaca agccagaatt cacagtagag ccagatggct tgattacagt aaaataa 957

<210> 205

<211> 1542

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 205

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<210> 206

<211> 2481

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 206

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<210> 207

<211> 888

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 207

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<210> 208

<211> 624

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 208

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<400> 209

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<211> 1476

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<213> *Streptococcus pneumoniae*

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<210> 211

<211> 1413

<212> DNA

<213> *Streptococcus pneumoniae*

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<210> 212

<211> 1008

<212> DNA

<213> Streptococcus pneumoniae

<400> 212

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<210> 213

<211> 1332

<212> DNA

<213> Streptococcus pneumoniae

<400> 213

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<210> 214

<211> 1428

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 214

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<210> 215

<211> 1827

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 215

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<210> 216

<211> 705

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 216

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<210> 217

<211> 1008

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 217

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<210> 218

<211> 411

<212> DNA

<213> Streptococcus pneumoniae

<400> 218

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<210> 219

<211> 3300

<212> DNA

<213> Streptococcus pneumoniae

<400> 219

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<211> 3651

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 220

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<211> 648

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 221

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<210> 222

<211> 1224

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 222

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gttcgtttag gtctgcctat tgggggaact gtcttcgcgg aagtggctat cttttcagtg 780
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 aatgtggcca gtctttatgg taacgacca aaatttatcg atttgacagt gcgtttttta 1080
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 gcaatccctg tgtacgctat ttga 1224

<210> 223

<211> 570

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 223

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 aaattagccc agaagtatga aaaggaccca gattccagtt tggctttgat tgagacaagt 180
 ggtgcttata gattggtgac caagcctcaa tttgcagaga ttttgaagga atactctaag 240
 gcgcctatca accagagctt gtctcgggct gcccttgaga ccttgtoaat tattgcctac 300
 aaacagccga ttacgcggat agaaattgat gccatccgtg gagttaactc gaggaggacc 360
 ttggcaaagt tgcaggcttt tgacctgata aaggaagacg ggaaaaagga agtattgggg 420
 cgccccaacc tctatgtgac tacggattat ttcctagatt acatggggat aaaccattta 480
 gaagaattac cagtgattga tgagcttgag attcaagccc aagaaagcca attatttggt 540
 gaaaggatag aagaagatga gaatcaataa 570

<210> 224

<211> 936

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 224

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 gcaatatttg catctgttat tttcaataga gcgaaactag ctacagatat tgaaaataat 180

gtccgtgtag tagtttatat ccgaaaggat gtggaagata atagtcagac aattgaaaaa 240
gaaggtcaaa ctgttacaaa taatgactac cacaaggat atgattottt gaagaacatg 300
tctacggtta aaagtgttac cttttcaagt aaagaagaac aatatgaaaa attaacccgag 360
ataatgggag ataactggaa aatctttgaa ggagatgcca atcctctcta tgatgcctat 420
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tcatttatcc gtgtttgggg actagggatt gctgctttgt taatttttat cgcagttttc 600
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cgcttggtcg gagctaaaaa cagttatata cgtggaccgt tcttggttaga aggagccttt 720
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taccaatctg tcaacaaatc gttggtaggg caaaatctat ccatgattag tccagattta 840
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<210> 225

<211> 1977

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 225

atgaagaaaag taagatttat ttttttagct ctgctatctt tcttagctag tccagagggt 60
gcaatggcta gtgatggtac ttggcaagga aaacagtatc tgaaagaaga tggcagtcaa 120
geagcaaatg agtgggtttt tgatactcat tatcaatctt gggtctatat aaaagcagat 180
gctaactatg ctgaaaatga atggctaag caaggtgacg actatcttta cctcaaactct 240
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ctaaaatccg gtggctacat ggcagccaat gaatggattt gggataagga atcttggttt 720
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 aagcttgaga atcccttcct tttcaaagat ttaacagagg ctacaaacta cagtgtctgaa 1560
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 ggcattacag cctatgatac gacccttac ctttctgcta agacatttga tgatgtggat 1800
 aagggaattt taggtgcaac caagtggatt aaggaaaatt atatcgatag gggaagaact 1860
 ttccttgga acaaggcttc tggtatgaat gtggaatatg cttcagacco ttattggggc 1920
 gaaaaaattg ctagtgtgat gatgaaaatc aatgagaagc taggtggcaa agattag 1977

<210> 226

<211> 867

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 226

atgaaaaaag tattacaaaa atattgggca tgggcttttg tggatcatccc cctcttggtta 60
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 acaggattga cttataacta caaatttggt ggcttaacaa actttaagct cctcttcatg 180
 gatccaaaat tcatgaatgc gattggcttt accgcaatca ttgcgattgc catggtgggt 240
 ggtgagattg cactcgggat cttcattgcy cgtgtcttga attctaaaat caaaggccaa 300
 accttcttcc gtgcttggtt cttcttccca gctgttttat ctggtttgac agtggctttg 360
 atcttcaagc aagtcttcaa ctacggctct ccagcgattg gaaatgccct tcatattgaa 420
 tttttccaaa ccagtctttt agggactaag tggggagcaa tctttgcggc tgtctttgtc 480
 cttctttggc aaggggtggc tatgcccatc atcatcttcc tagctgggtt gcaatctatt 540
 ccaactgaga ttacagaggc agcaaggatt gatggtgcca ctagcaagca agttttctg 600
 aacattgaat tgccttactt gctaccaagt gtctctatgg tctttatcct agccctaaaa 660
 ggtgggctga ctgcctttga ccaagtcttt gccatgaccg gtggtgggtc aaacaatgcc 720
 acaacctcac ttgggctctt ggtttataac tatgccttta aaaacaacca attcggttat 780
 gccaatgcca ttgccgtaat cttgttcttc ttaattgtag tgatttcgat catccaattg 840

agagtatcta agaaatttga aatttaa

867

<210> 227

<211> 837

<212> DNA

<213> Streptococcus pneumoniae

<400> 227

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 gatattgtag ataatttctt tggctttcca accaacttca catgggacaa ctttagccgt 180
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 aaaagaaaag cctttaccat catgtatacc ctcttaatcc tcggaatctt cgtacctttc 360
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 gggttgatct tgctctactt gacctatgcg attccacaga ccctctttct ctatgttggc 480
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 caatttaca cctatttccg catcatcttc ccaatgatga aaccgatgca tgcgacaacc 600
 atgatcatca atgccttttg gttctggaat gacttcatgt tgccactcct tgtcttgaac 660
 cgggattcca aaatgtggac tctgcctttg ttccaatata actacgcagg ccaatatttc 720
 aacgactacg gaccaagctt tgcctcttac gtggctcgga ttatcagtat caccattgtc 780
 tatctcttct tccaacgcca tatcatttca ggaatgagca acggggcagt gaagtaa 837

<210> 228

<211> 1044

<212> DNA

<213> Streptococcus pneumoniae

<400> 228

atgaaaagta ttcttcagaa aatgggggag catccgatgc tgcttctttt tottagctat 60
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 tttctattta ctattttctt tttgcaactat cagtogattt tatcccataa attctttcga 180
 ttgattttgc agtttgtctt gtttggtagt gtcttgtcag ctgcttttgc cagtttagaa 240
 catttccaaa ttgtgaagaa atttaactat gcttttcttt caccoaatat gcagggtgtgg 300
 catcagaacc gggcagaagt gaccttcttt aatcctaatt attatggaat tatttggtgt 360
 ttctgtatta tgattgcttt ctatctgttt acaacgacca agttgaattg gttgaaagta 420

ttctgtgtga ttgcaggctt tgttaatctc tttggtttga actttaactca aaatcgaact 480
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 aaggcctttt ggcttagtat tggggtcttc gcgattgggt tgagtttctt cttttctagt 600
 gatttgggag ttogaatggg tacttttagac tcttctatgg aagaacgcac ttctatctgg 660
 gatgctggga tggccttggt taagcaaaat cctttttggg gtgaagggcc attgacctat 720
 atgaactctt atcctcggat acatgctcct tatcatgaac atgcccacag tctttatatt 780
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 cctgttcgct tgatgatgga tatgagtcag gagtcgggga aacgtccgat tatcggcctt 900
 tatctatctt tccttacagt ggttgctgtg cacggaattt ttgacttggc tctcttctgg 960
 attcagtcag gctttatttt cttgctagtt atgtgcagta ttccattgga gcatcgaatg 1020
 ttggtatcgg acatgacgga ttaa 1044

<210> 229

<211> 1299

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 229

atgtcaaaga tggatgttca gaaaatcatt gcaccgatga tgaagtttgt gaatatgcgt 60
 ggcattatag ctctaaaaga tgggatgtta gcaattttgc cattgacagt agttggtagt 120
 ttgtttcttga ttatgggaca attgccgttc gaaggattaa ataagagcat tgctagtgtt 180
 tttggagcta attggacaga gccgtttatg caagtatatt caggaacttt tgctattatg 240
 ggtctaattt cttgtttttc aattgcctat tcttatgcta agaatagcgg agtagaggct 300
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 agaaaaattg ttattaagat gccagaacaa gttccacaag ctattgcaa acagtttgaa 540
 gcaatgattc cagcatttgt aattttctta tcttctatga ttgtatatat tttagcgaag 600
 tcattgacta atggcggaac attcatagaa atgatttatt ctgctattca agttccgttg 660
 caaggtttta ctggatcttt gtatgggtgt attggaattg cattctttat atcatttttg 720
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ccttggagta caccagctat tttatcagga tttttggtgg gtggatggca aggagttatt 1200
 actcagctgg tgatattagc gatgtotaca ttggtttatt ttccattctt taaagtacag 1260
 gatcgtttag cttaccaaaa tgaaatcaaa caatcttag 1299

<210> 230

<211> 303

<212> DNA

<213> Streptococcus pneumoniae

<400> 230

atgaagaaaa aggacttagt agaccaacta gtctcagaga tcgagacggg gaaagtcagg 60
 aactgaggaa tatacgggtca tggagcttca ggtaaataca cctttgcaca ggaattgtac 120
 caagcttttag attctactac agtaaatttg ctagagacag atccttatat cacctcagga 180
 cgccatctgg tagtaccocaa ggacgcgcgc aatcaaaaagg tgacagccag tctgccagt 240
 gcgcacgaac tggagagttt gcagagagat atccttgctt gcaggcgggt atggatgtct 300
 tga 303

<210> 231

<211> 717

<212> DNA

<213> Streptococcus pneumoniae

<400> 231

atgaagaaaa gatacctagt cttgacagct ttgctagcct tgagtctagc agcttggttca 60
 caagaaaaaa caaaaaatga agatggagaa actaagacag aacagacagc caaagctgat 120
 ggaacagtcg gtagtaagtc tcaaggagct gccagaaga aagcagaagt ggtcaataaa 180
 ggtgattact acagcattca agggaaatac gatgaaatca tcgtagccaa caaacactat 240
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 tatatggctg aagaatggca cctgcgttat gtaggaaaag aagctaaaga aattgctgca 660
 agtgggtctca gtttggaaga atactatggc tttgaaggcg gagactacgt cgattaa 717

<210> 232

<211> 1269

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 232

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 agcacagaaa aagaagtcgt ctatacttcg aaagaaattt attaccttc acaatctgac 120
 tttggtat ttttagaga aaaattaagt tctcccatgg tttatggaga gggtcctgtt 180
 tatgcgaatg aagatttagt agtggaatct gggaaattga ctcccaaac aagttttcaa 240
 ataaccgagt ggcgcttaaa taaacaagga attccagtat ttaagctatc aaatcatcaa 300
 tttatagctg cggacaaaacg atttttatat gatcaatcag aggtaactcc aacaataaaa 360
 aaagtatggg tagaatctga ctttaaactg tacaatagtc cttatgattt aaaagaagtg 420
 aaatcatcct tatcagctta ttgcgaagta tcaatcgaca agaccatgtt tgtagaagga 480
 agagaatttc tacatattga tcaggctgga tgggtagcta aagaatcaac ttctgaagaa 540
 gataatcgga tgagtaaagt tcaagaaatg ttatctgaaa aatatcagaa agattctttc 600
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<210> 233

<211> 1959

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 233

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 ttcttgtga caggattcca gtatttctat tctgggaata actcaggagg aagtcagcaa 120

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gaagaaacag	gtattcagtt	tttcacgcca	tctgttacta	aggtagagaa	atttaccagc	300
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gctctttacg	aaacaggaaa	gatgcctgaa	gcagtagaag	aggaatctca	tgactatcc	1920
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<210> 234

<211> 1278

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 234

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<210> 235

<211> 1692

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 235

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<210> 236

<211> 1692

<212> DNA

<213> Streptococcus pneumoniae

<400> 236

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<210> 237

<211> 1140

<212> DNA

<213> Streptococcus pneumoniae

<400> 237

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<210> 238

<211> 1338

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 238

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 gataaggtct gctcgtcagt caatatcggc tcaaccaagt ctggtattaa tatgacggct 480
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<210> 239

<211> 858

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 239

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<210> 240

<211> 1212

<212> DNA

<213> Streptococcus pneumoniae

<400> 240

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<210> 241

<211> 981

<212> DNA

<213> Streptococcus pneumoniae

<400> 241

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<210> 242

<211> 1281

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 242

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<210> 243

<211> 1263

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 243

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<210> 244

<211> 2355

<212> DNA

<213> Streptococcus pneumoniae

<400> 244

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<210> 245

<211> 1542

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 245

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 ccgatttcct tcttgggact cgctggtagc tottatgcag gtagctggat tttatggttt 240
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<210> 246

<211> 1455

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 246

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 tatgtggatg gcagccagtc aagtcagaaa agtgaaaact tgacaccaga ccaggtttagc 180
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 cacggagacc acaatcatta tttcttcaag aaggacttga cagaagagca aattaagggtg 1440
 cgcaaaaaca tttag 1542

<210> 247

<211> 462

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 247

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 ttcgtttagct tgacctacct gcaaaatoga ggtgcagcct tttctatcct acaagatcag 180
 cagctgttat tcgctgtcat tactctgggt gtctgatag gtgccatttg gtattttacat 240
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<210> 248

<211> 855

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 248

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 gtaggggata cgggtcaaagg ttttgcatat acggatatga agcaaaaact ccgectgaca 180
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 gatattctcc ctgagctcaa ggaactctgg cctaagaagg gcgaccaact ctacatccgt 360
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<210> 249

<211> 1185

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 249

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<210> 250

<211> 1347

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 250

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 gatgcagatt ttggtctatc aggaattatt ttaggaatgt taaatcaatt tggctcacia 1260
 gcaggcattg tgattggtct tgttcttatt ctagcagtta tgtttgaggt atcctttatt 1320
 aaaaagccat ctgcaacgga ggaataa 1347

<210> 251

<211> 1002

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 251

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 cagatttatg ccttccctt agctactgca actatggctg ctattttaag tttcttattt 180
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 aatatcagag gtgagcaaga aaaccagaga atcaaaactat tgtttcatca agttggactt 480
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<210> 252

<211> 1278

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 252

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<210> 253

<211> 1380

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 253

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<210> 254

<211> 618

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 254

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<210> 255

<211> 1200

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 255

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<210> 256

<211> 714

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 256

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gactatgctg gggcgcgtgc gaccacaagc tggagtgcgc gcctagcaga acagtttggt 660
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<210> 257

<211> 606

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 257

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aaattacgta atgcacaaga attacttcgc aaagatgctg aagactttga ctgggaaaat 600
ttgtaa 606

<210> 258

<211> 843

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 258

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<210> 259

<211> 801

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 259

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09769757 015604

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attacagagg aggaaaaacta a 801

<210> 260

<211> 390

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 260

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caattaaata atctcaagga gcaatggcaa gaaaaagccg aagctcttga tgactcagaa 360
gagattgtga ttgatataac agaagaataa 390

<210> 261

<211> 618

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 261

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<210> 262
<211> 1914
<212> DNA
<213> Streptococcus pneumoniae
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<210> 263

<211> 684

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 263

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cctgccatcg attttttgat ggcaagtttg gattggacac ccaaggattt ggaccgaatc 180
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gagtcttaca ttaaacgcct atga 684

<210> 264

<211> 438

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 264

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09769757-01504

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gaaatagatg aaggatag 438

<210> 265

<211> 558

<212> DNA

<213> Streptococcus pneumoniae

<400> 265

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aaagtaaccg cccaataa 558

<210> 266

<211> 1437

<212> DNA

<213> Streptococcus pneumoniae

<400> 266

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<210> 267

<211> 1347

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 267

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<210> 268

<211> 1974

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 268

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<210> 269

<211> 1416

<212> DNA

<213> Streptococcus pneumoniae

<400> 269

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<210> 270

<211> 555

<212> DNA

<213> Streptococcus pneumoniae

<400> 270

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 gaggcggaac atatgtgtat gagtatgcgt ggtgttagaa aaccaggcac tgcaaccttg 480
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 ttaatggggc tataa 555

<210> 271

<211> 1050

<212> DNA

<213> Streptococcus pneumoniae

<400> 271

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<210> 272

<211> 1197

<212> DNA

<213> Streptococcus pneumoniae

<400> 272

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<210> 273
 <211> 1218
 <212> DNA
 <213> *Streptococcus pneumoniae*

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<210> 274
 <211> 2292
 <212> DNA
 <213> *Streptococcus pneumoniae*

<400> 274
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 cattttccat aa 2292

<210> 275

<211> 960

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 275

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<210> 276

<211> 954

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 276

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<210> 277

<211> 1614

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 277

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<210> 278

<211> 315

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 278

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 attcaccag atccagaagg aaaacgtgaa gcagtgcgtc gccgtatcga agaagaaaaa 240
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 ggtgaaaaaa tttaa 315

<210> 279

<211> 792

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 279

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<210> 280

<212> DNA

<213> Streptococcus pneumoniae

<210> 281

<211> 795

<212> DNA

<213> Streptococcus pneumoniae

<400> 281

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<210> 282

<211> 819

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 282

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 aaatcacgtg aaatgttgct agaatgggtc ccaaagaatg ttcataaagc aacaggtttg 600
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 gccaatgacc tctctatgat tgaatgggca ggtcttggtg ttgctatgca aaacgctggt 720
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<210> 283

<211> 1257

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 283

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<210> 284

<211> 942

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 284

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<210> 285

<211> 1512

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 285

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atttacgaga ctacgcctca aaatccacaa gggatttggg atgtcctcat ggcaccgatt 180
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gtacttcgtc tgatcttctg ggttaccttg actgctctta gtacttggtt tgtttaccgt 660
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 ccattcctat aa 1512

<210> 286

<211> 1332

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 286

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 cttgcaactt aa 1332

<210> 287

<211> 2349

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 287

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 tcactagttc ctatcttaat aggaatatcc tcttttggtg cgagtctttt agttccggtg 180
 gttactaaaa ggtagcgct aaataggggtt ttatctttat ctcaatttgg aaagactata 240
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<210> 288

<211> 1245

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 288

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<210> 289

<211> 1269

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 289

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<210> 290

<211> 621

<212> DNA

<213> Streptococcus pneumoniae

<400> 290

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<210> 291

<211> 444

<212> DNA

<213> Streptococcus pneumoniae

<400> 291

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 aaagagaagg gaaatgaggt ttag 444

<211> 1521

<212> DNA

<213> Streptococcus pneumoniae

<400> 292

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<210> 293

<211> 810

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 293

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 aaggctatct gggatgacct ctttgcccat cgtagttttg cccagtggat ttatttgctg 180
 gttttaggaa gttttcctct ctggctggag ttggtttacg aacatcgtat tgttgactgg 240
 attgggatga tttgtagctt gacagggatt atctgtgtaa tctttgtatc ggaaggtcga 300
 gcaagtaatt atcttttttg cttgattaac tctgttattt accttatttt ggccctacag 360
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 tttggcttca tttatcagtc tattggtgcc aatcgccct atcgtgattc aatcacagat 600
 gcaaccaatg gggtagggca aatcctcatg acagctgttt accgtgaaca gtggatattc 660
 tgggcggcta ccaatgtctt ttcaatctat ctctggtggg gagaaagcct gcaaattcaa 720
 gggaaatata taatttatct cattaacagt ctagttggtt ggtatcaatg gagcaaggca 780
 gctaagcaga atactgattt acttaactag 810

<210> 294

<211> 900

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 294

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 gtgcatgact tgggagatgc gattgcaatt ggaatatcag cttttctaga aacaatctcc 180
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 aagattttgc atccgcaacc agtcaatgat gaggggattc tctggttagg aattattgag 360
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<210> 297

<211> 1380

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 297

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 ccttttgtcc aagttgaaag ctacagagcg acttattttg atcatctttt cactgctgtc 180
 tctgcagtct gtgtgacggg tctctcaacc cttccagtag ctcacaccta taatatctgg 240
 ggtcaataaa tctgtttgct cttgattcag atcgggtggc tagggctcat gacctttatt 300
 ggggttttct atatccagag caagcaaaag cttagtcttc gtagccgtgc aactattcag 360
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 aatctggtga ttgcaggctt gattattaca ggcggccttg gttttatggt ctgggttgat 660
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 atgccactta tgtttatggg acgaattggt cccttgacct tgtttgtag cttggcagat 1320
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<210> 298

<211> 666

<212> DNA

<213> Streptococcus pneumoniae

<400> 298

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 cagttttgagc cagttttggc gcgtggagtg attggtgaca tcacagatga agaattattg 180
 agatcagcag ggattgatac ctgcgatacc gttgtagtcg cgacagggtga aaatctggag 240
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 gtctttcagt tggataaaaa tgtgtctatc gtggagatga aaattcctca gtcttgggca 480
 ggtcaaaagtc tgagtaaatt agacctcgt ggcaaatata atctgaatat tttgggtttc 540
 cgagagcagg aaaattcccc attggatgtt gaatttggac cagatgacct cttgaaagca 600
 gataacctata ttttggcagt catcaacaac cagtatttgg ataccctagt agcattgaat 660
 tcgtaa 666

<210> 299

<211> 540

<212> DNA

<213> Streptococcus pneumoniae

<400> 299

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aaagaggggtg	acttatcaga	aaaaccagga	gacaccgttc	tcactcaagc	gaaacctgag	240
ggcgttactg	gaaatacgaa	ttcacttccg	acacctacag	aaagaactga	agtgagcgag	300
gaaacaagcc	cttctagtct	ggatacactt	tttgaaaaag	atgaagaagc	tcaaaaaaat	360
ccagagctaa	cagatgtctt	aaaagaaaact	gtagatacag	ctgatgtgga	tgggacacaa	420
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gccggtgtaa	accaagtaat	tccttatgaa	ctattcgctg	gtgatggtat	gttaactcgt	600
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actattaaca	taaacggttt	aatttctaaa	gaaacagttc	aaaaagccgt	tgcagacaac	1380

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 ccagacttgg acaacatcgt agcaactaaa aaagtcacta ttaacataaa cggtttaatt 1800
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 cagcctacct ag 1872

<210> 301

<211> 1053

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 301

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 gggatgacca tcgttgccag ccttgctcgtt gctgggatta gtctctttct cctattgcca 180
 gtctttacgt cgttgggcaa actcaaggag catgccaaagc gggtagcggc caaggatttt 240
 ccttcaaatt tggaggttca aggtcctgta gaatttcagc aattagggca aacttttaat 300
 gagatgtccc atgatttgca ggtaagcttt gattccttgg aagaaagcga acgagaaaag 360
 ggcttgatga ttgccagtt gtgcgatgat attaagactc ctatcacttc gatccaagcg 420
 acggtagaag ggattttgga tgggattatc aaggagtcgg agcaagctca ttatctagca 480
 accattggac gccagacgga gaggtcfaat aaactgggtg aggagttgaa ttttttgacc 540
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 aacatgaaga caggtgggtca tggattagga cttgcgattg cgcgtgaatt ggcccatcaa 960
 ttgggtgggg aaatcacagt cagcagccag tacggtctag gaagtacctt taccctcgtt 1020
 ctcaacctct ctggtagtga aaataaagcc taa 1053

<210> 302

<211> 528

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 302

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 gttgagcagg gtactggaaa tcaccgtcgt gagttcaata tgattcagca gatattctcg 180
 cattttggga tgactcactt gggacaaatc aagttgggtct atcaagagtc gattgacott 240
 gagttgctgg tcaatgcact taatcatcac ttgctcattg acagactggg cctcacgccc 300
 aatcaaataa cgatagaaat cgacaggcag atagtacatg gtcttgacot gctgaagggg 360
 cgtaaagaca aagagattat cgacataaaa agtatgttca ggcagttaga actggctagc 420
 acgcaacaaa tctgtccgat aaatcagcga gtgcatcatg gtatactggc ctttggagaa 480
 atttccgacc tgggtcccagc caaaaatctg ccgaacaggc aagactga 528

<210> 303

<211> 477

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 303

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 attgtattgg cggttggatt aagcggtatg gggctctgctt atggagttgg taaggctggg 120
 caatctgccg cagctttact gaaagaacag cctgaaaagt ttgcctcagc tttgatattg 180
 caattattgc cgggaacaca aggattatat gggtttgtta ttggaatttt aatttggttg 240
 caattaactc cagaacttcc tttagaaaaa ggcgttgctt atttctttgt agctcttcca 300
 attgctattg taggatactt ttcagctaag catcaaggaa atgtagcagt agcgggaatg 360
 caaatcttgg ctaaaagacc aaaagaattc atgaaggag caatttttagc tgccatggta 420
 gaaacctatg caattcttgc ttttgtcgta tcattcattt tgacccttcg tgtataa 477

<210> 304

<211> 498

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 304

atgttaaaat cagaaaaaca atcacgttat caaatgttaa atgaagaatt gtccttccta 60
 ttggaaggcg aaaccaatgt tttggctaata ctttccaacg ccagtgtctt cataaaatca 120
 cgttttccta ataccgtatt tgcaggcttt tatttggtcg atggaaagga attgggttta 180
 ggcccccttc aaggaggtgt ttctgcac cgtattgcac taggcaaggg tgtttgtggt 240
 gaggcagctc actttcagga aactgttatt gttggagatg tgacgaccta tctcaactat 300
 atttcttggtg atagtctagc taaaagtga attgtggtgc cgatgatgaa gaatggtcag 360
 ttacttgag ttctggatct ggattcttca gagattgagg attacgatgc tatggatcga 420
 gattatattgg aacaatttgt cgctatattt cttgaaaaga cagcatggga ctttacgatg 480
 tttgaggaaa aatcttaa 498

<210> 305

<211> 771

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 305

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 ggggttaacc tgacctgaa aacaggagaa attgccgcta tcatgggacc aaatggtaca 120
 ggtaaatacga ctctttctgc cgctatcatg ggaaatccaa actatgaagt aactaaaggt 180
 gaagttttgt ttgatggcgt aaacatcctt gagttggaag tggatgagcg tgcgcgtatg 240
 ggacttttcc ttgctatgca ataccatca gaaatccctg gaattaccaa tgctgagttt 300
 ctctgtgccg ctatgaatgc gggtaaagaa gatgatgaga agatttcagt tcgtgagttt 360
 attactaagc tagatgaaaa aatggaattg ctcaacatga aagaagaaat ggcagagcgt 420
 tacctcaacg aaggcttctc tgggtggtgag aaaaaacgca atgaaattct tcaacttttg 480
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 atcactcact accaactctt tttgaactat atcacacctg atgtggtaca cgtgatgatg 660
 gaaggtcgtg ttgtccttcc tgggtggtcca gaattggctg cgcgtttgga acgtgaagga 720
 tacgcaaaat tagctgaaga acttggtctac gactacaagg aagaattgta a 771

09760787 045604

<211> 471

<212> DNA

<213> Streptococcus pneumoniae

<400> 306

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gagcaaatca	gtctcaacaa	tccgacttgt	ggggatgtca	tcaacctctc	tgtcaagttt	180
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ggagacgcgg	cattcttgtc	aggtgttgcc	aaattccctc	aaagaatcaa	gtgtgcaacc	420
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<210> 307

<211> 1953

<212> DNA

<213> Streptococcus pneumoniae

<400> 307

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 gtttatgggtt acctacgcaa accacaagca taa 1953

<210> 308

<211> 2304

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 308

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<210> 309

<211> 528

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 309

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<210> 310

<211> 471

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 310

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 accctctcac gcgacatcaa aaatatgaac ctatcaaaag tccgcgaaga agatagcgct 180
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 accctttgtg gtaatgatgt ctgtcttata atctgtgaag atgcagatac tgctcaaaag 420
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<210> 311

<211> 1488

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 311

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 ttcaactcag tcgacactat tttgtcattt ttcttgcctt ttgcaactta tgggtgtctat 180
 aactacgggt taagggctat cagtaatgtc aaggataaca aaaaagatct taacagaacc 240
 ttttctagtc ttttttattt gtgcacgct tgtacgattt tgaccactgc tgtctatatc 300
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ctgattaact acctgattag ttatTTTTtg attaaaagag acatcaaact tgttaaaatt 600
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<210> 312

<211> 804

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 312

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 aaaattattg atactcgaaa taaaaaacc tatgagtctg gtatctttat cgatattttc 360
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 aaactgctgt ctttcagtaa acataaaaat attgtctata aggatagcct tttaaaagat 480
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<210> 313

<211> 1527

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 313

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F03670.262626

<210> 314

<211> 714

<212> DNA

<213> Streptococcus pneumoniae

<400> 314

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<210> 315

<211> 807

<212> DNA

<213> Streptococcus pneumoniae

<400> 315

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<210> 316

<211> 561

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 316

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<210> 317

<211> 900

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 317

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<210> 318

<211> 543

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 318

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<210> 319

<211> 861

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 319

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<210> 320

<211> 534

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 320

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<210> 321

<211> 3711

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 321

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<210> 322

<211> 1350

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 322

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<210> 324

<211> 651

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 324

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 ctgatgacag tctttaggtg gcgccatctt tacctgagag ctctatctgc tcacggatat 540
 gacgaacatg cacagttgaa gaatagctat cggacttttt atattcctaa aaaaacaaaa 600
 ttaatotacc tgcttttctt tttattgctt caaaccagtc tattttttata a 651

<210> 325

<211> 525

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 325

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 aatattctag caggaatcat gatgggacct gtttatgcct tggctatggc tacagtcaca 180
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<210> 326

<211> 804

<212> DNA

<213> Streptococcus pneumoniae

<400> 326

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 atggcagatg attcccgtga agttcttgat tttactaagc aaagtcaggc tctcttcac 180
 aatttggggc atttgtcagc tgagaaggaa aaagcaatcc gcatggcagc ttcgtatgca 240
 aaccaatctt ctctcccgat ggtagtagat gcggttggcg taacgacttc atccattcgt 300
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<210> 327

<211> 834

<212> DNA

<213> Streptococcus pneumoniae

<400> 327

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<210> 328

<211> 726

<212> DNA

<213> Streptococcus pneumoniae

<400> 328

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 aatgaattag acatagcaag tcttcgccag aagtttgagt ctactgaata ttttattcct 660
 aagtctgaaa aattcttcct tggtaaagat agaaataatg ttgaattgtg gtttgaagaa 720
 gtatga 726

<210> 329

<211> 936

<212> DNA

<213> Streptococcus pneumoniae

<400> 329

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 gaccagagc atggcttgca gactgaggca ggactagttt atgacctagc tagtgtcagc 180
 aaggttggtg gggttggcac agtttgtacc ttcttggtgg aaataggtca attagatatt 240
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<210> 330
<211> 483
<212> DNA
<213> Streptococcus pneumoniae
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<210> 331
<211> 792
<212> DNA
<213> Streptococcus pneumoniae
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<400> 331
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 aaactcttta ctcttatat cctttatatt gtcccttaca tgggtgcttga aaaatatgaa 780
 gataatgttt aa 792

<210> 332

<211> 651

<212> DNA

<213> Streptococcus pneumoniae

<400> 332

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 caggatgctg ttatcttttt caagagagaa ttgatttcaa ttttttctta taatgactat 180
 tctgaagcga atttagaaat ccccaaacta ttgttaaacc tttcgctttt catggtagga 240
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 gtgggacaag aatggatgat ggatcatatt gtaacagtgt atttagtact ctttaagttta 600
 ttagttatgt tgattgttag tcgcttgga gagaaattta agaaaggata a 651

<210> 333

<211> 525

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 333

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 tatgatagca agacottggt gtttgcagta gataaggaag atatcggaca ggaaattatt 180
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<210> 334

<211> 1518

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 334

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<210> 335

<211> 1329

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 335

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<210> 336

<211> 840

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 336

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<210> 337

<211> 1890

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 337

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 acggcagagt ttagacagaa gatagtttac cagtttgagg aggactttaa gggccaaatc 180
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 ggaggtggcg gcagtatcgg tgcccttttaa 1890

<210> 338

<211> 2661

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 338

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[illegible]

<210> 339

<212> DNA

<213> Streptococcus pneumoniae

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aaactattgg	caacagatgg	ggatatggat	aaaattgcaa	atgagttaga	aacaggtaac	180
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<210> 340

<211> 1173

<212> DNA

<213> Streptococcus pneumoniae

<400> 340

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 caagtatgga agttggatga ttctgtattcc tatgatgatc gggtgcaaat tgtaagagac 240
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gaggatcaac ttgcttaa 1998

<210> 340

<211> 1173

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 340

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<210> 341

<211> 1566

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 341

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<210> 342

<211> 741

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 342

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<210> 343

<211> 690

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 343

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 ggcaatttat tctggattca aaatatcttg agtttacttt ttattggagt catgattgtg 180
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690

<210> 344

<211> 1040

<212> DNA

<213> Streptococcus pneumoniae

<400> 344

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<210> 345

<211> 1059

<212> DNA

<213> Streptococcus pneumoniae

<400> 345

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<210> 346

<211> 831

<212> DNA

<213> Streptococcus pneumoniae

<400> 346

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 ccggttattt tggccctgtt ccaagcccta tcaagagttg actttttaaa gacaggtcat 480
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 ggtggagtgc cctatactg gacagtgtct aatgcttata aagtcttgca aacctatttc 720
 ttgaataatc cattcaagat tatcgcagag cgcgaggccg tagtacaggc acaaaaagat 780
 ttggaataa gaaaaagaaa agccaagaaa aaggctcaga aaacgaaata a 831

<210> 347

<211> 795

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 347

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 tctactaatg agattctaga actttggaaa atgcgaaaag atcgcttgca atacgatttc 660
 catccattta tctgggaagt tggcggttaag tacacttacc ctcaagatca acacttagta 720
 gaataccatc atccacgtgg ttttgatgat tgttttgaac aagactctaa cattcaattt 780
 aaagctttgc tataa 795

<210> 348

<211> 585

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 348

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 gtagaagaac ccttgaaatt attgtcactt gtttttggtt tggctttgat tcctgtgcga 180
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 gaaacagagt tgcttttagc gattccagtg gttacggcta ttgctctcta tgggttttat 540
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<210> 349

<211> 390

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 349

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ctaattatgg agttgcaaga attagtggag cgcagttggg caatccgaca agcttatcac 120
gaactggaag ttaagcatca tgattccaag tggacggtag aagaagacct cttggcttta 180
tctaatagata ttggaaattt ccaacgactg gtgatgacaa agcaaggacg ctactatgat 240
gaaacaccct acacactgga acaaaaactt tcagaaaata tctggtggct attagaactt 300
tctcaacggt tggatataga cattctgacg gaaatggaaa acttcctctc tgataaagaa 360
aagcaattga acgttaggac ttggaagtag 390

<210> 350

<211> 975

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 350

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atttacttcc tctacttttt cttcttgtgt tgctttgtaa ccatattatt tttcacttgg 180
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gtggttattg agcaaatcat ctcaaacagt ctcaagtaca ccaaggaagg tggctctggag 720
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0976979 043604

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975

<210> 351

<211> 588

<212> DNA

<213> Streptococcus pneumoniae

<400> 351

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 tttatcaaca ctatgttgaa ccgtaagaat ctgcgccgta catcaggaaa acctggtaaa 180
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 ccgtcagcag atgatgtgca gatgtacgaa tttctcaagt attatgagat tccagtcac 420
 attgtggcga ccaaggcgga caagattcct cgtggtaaat ggaacaagca tgaatcagca 480
 atcaaaaaga aattaaactt tgacccgagt gacgatttca tctctttttc atctgtcagt 540
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<210> 352

<211> 891

<212> DNA

<213> Streptococcus pneumoniae

<400> 352

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P05972.01504

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 cgtagtgtgg catttgctaa acgcttggcg caggacttat ccaagaattg gtctgttaat 840
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<210> 353

<211> 978

<212> DNA

<213> Streptococcus pneumoniae

<400> 353

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 tcttcagggtg aactccgaaa aaatatgcaa cagttgacac cgccagggtga tcttcgtaat 180
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<210> 354

<211> 1179

<212> DNA

<213> Streptococcus pneumoniae

<400> 354

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<210> 355

<211> 678

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 355

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 atctactatc ccctacttgt tcacatgtta agcaacagcc tctccttaatt catttttagct 660

atcagtatag taaaatga

678

<210> 356

<211> 1158

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 356

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<210> 357

<211> 621

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 357

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09769787 012501

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 tcggttaaga aggaagtttc cttttatggg catattttcc gagatcttgt attggtcatt 600
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<210> 358

<211> 1017

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 358

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<210> 359

<211> 996

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 359

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<210> 360

<211> 867

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 360

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 ttatacagtg ccttgatttt agcagtcctgc ctcatgattc caacatttaa gcaaacaatc 840
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<210> 361

<211> 1068

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 361

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 aaaagtcaag aattagttat ctattcgaac tcagtcctcaa atggctcgtgg tgattgggtta 180
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 tgggggttctg gtgcattagt tggacaaaaa gaacaaaatg ttgttttcaa agttatgact 780
 cctgagattg gtgtaccatt tgtaactgaa caaactatgg ttttaagcac tagtaaaaaa 840
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 agtaagaact ttggatctat tcctgcaaat aaagatgccc tcaaagatct acctgaagat 960
 acgaagaaat ttgttgatca agtgaaacca caaaatattg actgggaagc tgttggaaag 1020
 catttgatg aatgggtaga aaaagctgaa ttagaatacg tacaataa 1068

<210> 362

<211> 1011

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 362

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tcaactactt tgagagcatt ggtaggtttt ctagatccat catcaggaag tattgaagtt 180
aatggaacag atgtcactca tttggaacct gaaaagcgtg gaattggtat tgtattttcaa 240
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aagaaggtag ctccagatgt tattaaagct aaagtatcag cagtggcagc aaaaattaag 360
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gatgaaacag tccacgaagt attattgaaa aatacaagcg ttttcttaga ggataaaaaa 780
ggatacatte gattagagaa agttcgattc aatcgtgaaa ctgaacaaga ttttattcta 840
aaagggacaa ttattgatgt tgagttttct ggagttacaa ttcactatac aataaaagtt 900
tctgaaagtc agattcttaa tgtaaeaagt attgatagtc aggcctgctat tagatctgtc 960
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<210> 363

<211> 1692

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 363

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gaattttccc ttgatgctgt acatcgtgtt ctaaaatctc agagggcaat tcagagtatt 180
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tgtgttctat ttacagagta ctttgatatt aaaggtgcta aaattttaaa attaggttat 300
atgacctctt taatttatgg aggagtgggt ttagcgactg gatataaatt tgtctatgg 360
ccttatggat tgattacaaa atttttacaa aatgttatcc cttctttaga ccctaactgg 420

<400> 364

Leu Pro Xaa Thr Gly

1

5

<210> 365

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 365

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18

<210> 366

<211> 10

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 366

ttgcgggcgc

10

<210> 367

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 367

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38

<210> 368

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

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39

<210> 369

<211> 40

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 369

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40

<210> 370

<211> 29

<212> DNA

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<223> Description of Artificial Sequence: Primer

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29

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<210> 374

<211> 32

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

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32

<210> 375

<211> 42

<212> DNA

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<223> Description of Artificial Sequence: Primer

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42

<210> 376

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

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28

09769370-04941

<210> 377

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

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<400> 377

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43

<210> 378

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<212> DNA

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<210> 379

<211> 34

<212> DNA

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<223> Description of Artificial Sequence: Primer

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34

0076939 01301

<210> 380

<211> 35

<212> DNA

<213> Artificial Sequence

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35

<210> 381

<211> 39

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39

<210> 382

<211> 37

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

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37

0936979-04304
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<210> 383

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<400> 383

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34

<210> 384

<211> 35

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 384

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35

<210> 385

<211> 40

<212> DNA

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<210> 386

<211> 34

<212> DNA

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34

<210> 387

<211> 39

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

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39

<210> 388

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 388

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31

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T052710 28269260